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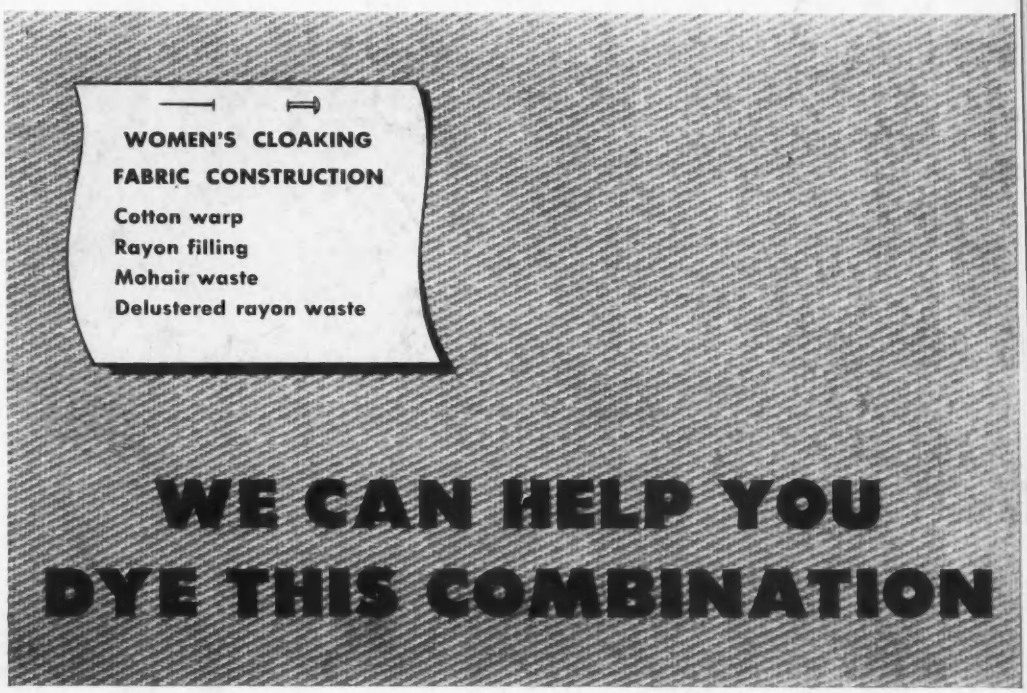
ULY 20, 1942
OLUME 31, No. 15

AMERICAN DYESTUFF REPORTER



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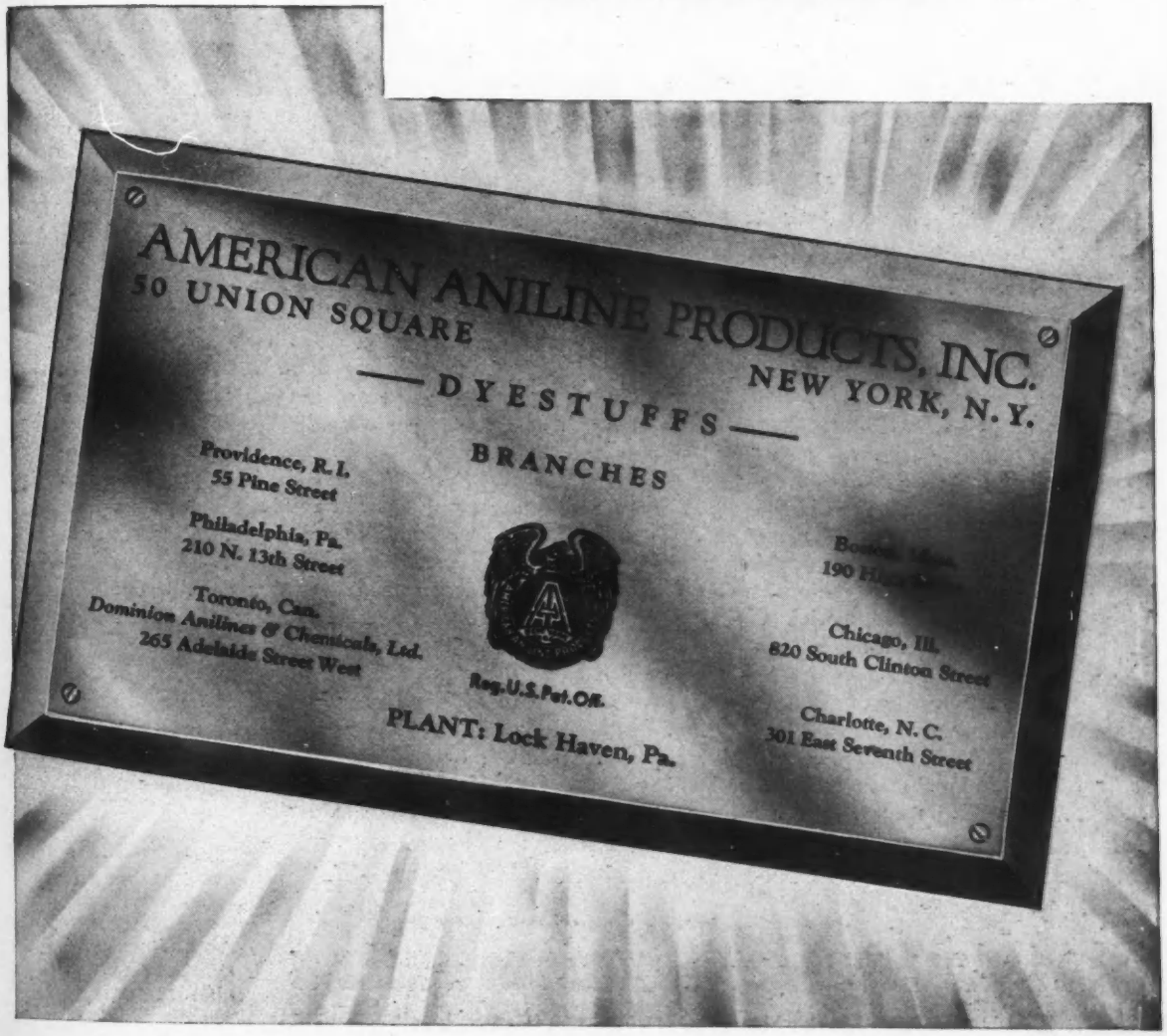

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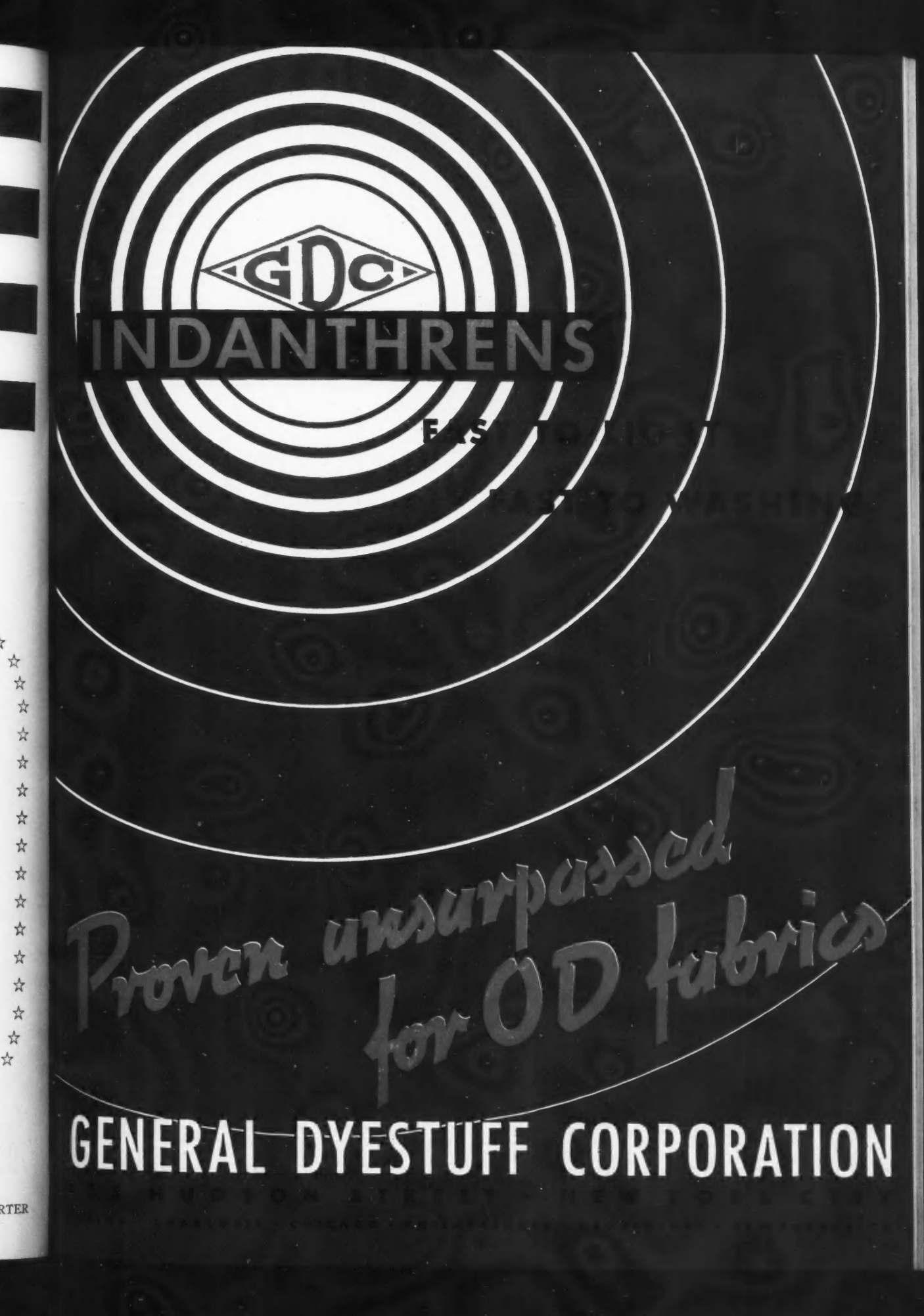
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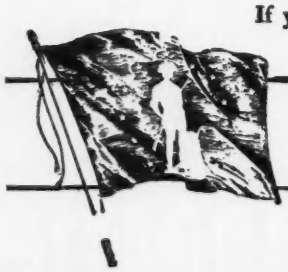

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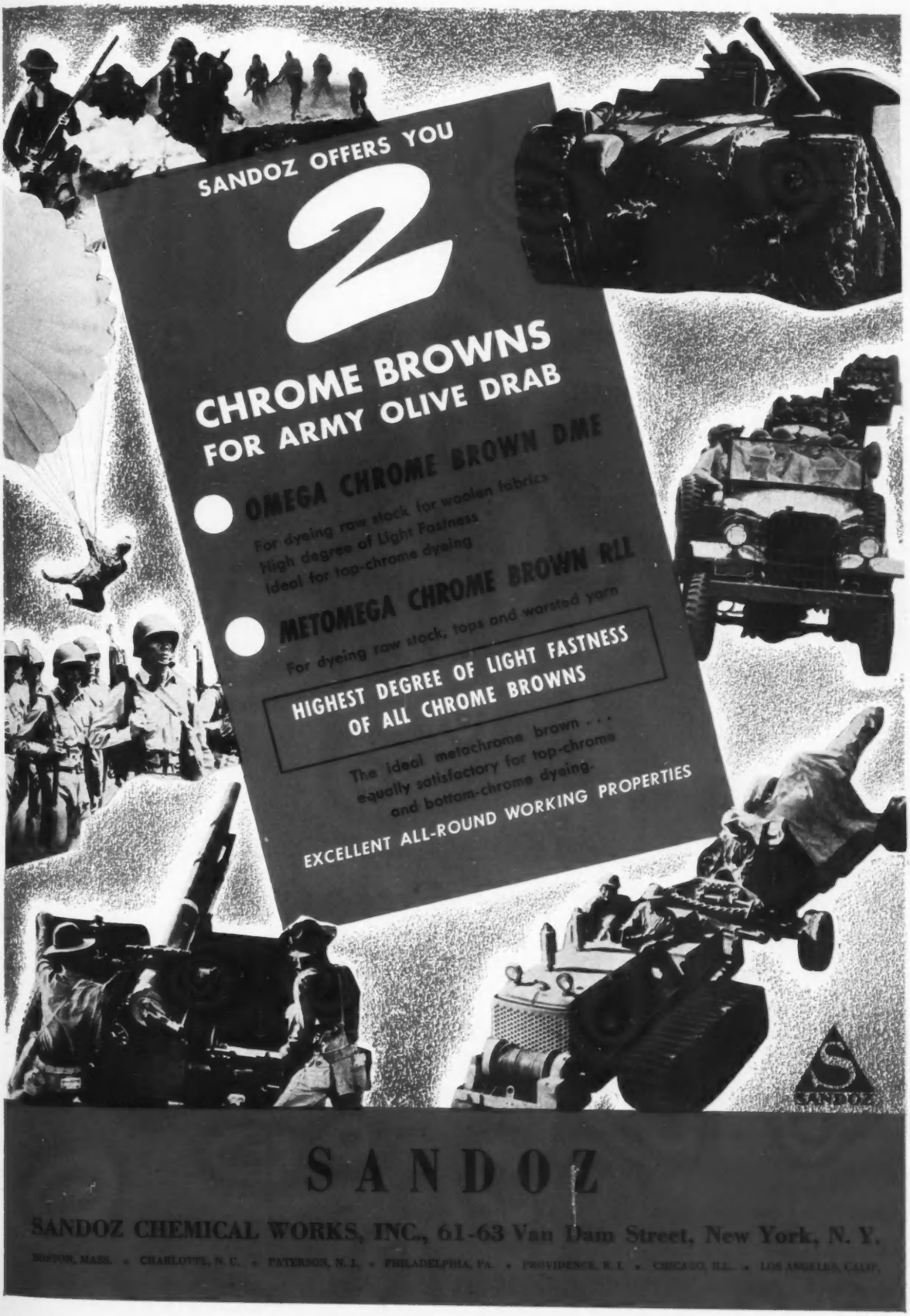
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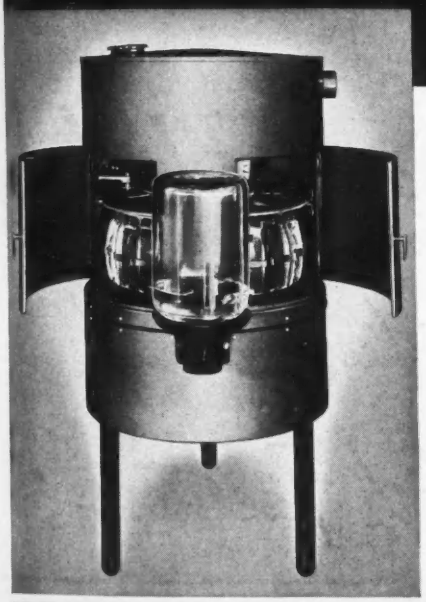

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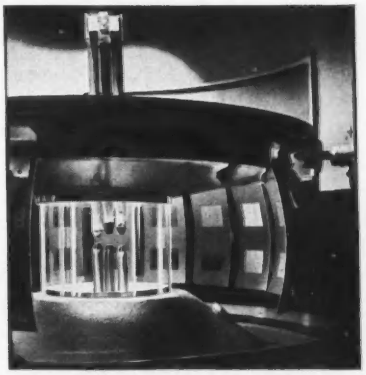

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JULY 20, 1942

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DYESTUFF REPORTER

VOLUME 31 JULY 20, 1942 NUMBER 15

PACKAGE TESTING

Previous to Pressure Dyeing

DAVID C. HARDMAN
Woonsocket Rayon Co.

PRESSURE dyers of cotton yarns often declare that ninety per cent of their success in dyeing depends on yarn preparation, i.e., on the package to be dyed. This may appear exaggerated and pessimistic, but examination and study of types of packages prepared for dyeing proves it an understatement, for there are more variables in package preparation than in all other phases of pressure dyeing. There is abundant evidence to indicate that dye house production losses exceeding fifty per cent of potential production are due to faulty yarn preparation, while the amount of inferior, streaky, unlevel dyeing from this source cannot be estimated. Little has appeared in print on the subject, perhaps because the dyer has had to be too preoccupied overcoming the many different obstacles caused him by inefficient yarn preparation to set up usable standards.

It has been stated, "A firm package is better than a soft one." But what is a firm package? What is a soft package? Davidson wrote in the DYESTUFF REPORTER about five years ago, "Unless . . . the winding room . . . delivers to the dye house packages uniformly wound, neither too hard nor too soft, with special emphasis on the uniformity of each batch with regard to firmness, no dyer can turn out acceptable work . . ." This is a very true statement of the necessity of uniform densities, but what degree of uniformity or within what tolerance of density must the packages be prepared for the dyer? What effect has the angle of wind on the dyeing properties of a package? Is yarn count a factor? These are reasonable questions and must be answered.

As this paper is strictly from the viewpoint of the dyer, it will not discuss the merits or demerits of the various types of winding equipment. It is with the product and not with the performance of these machines that the dyer is confronted. Too, all reference to dyes and dyeing in this paper refer to vat or naphthol colors because they are most expensive and most difficult to apply, because they can seldom be successfully stripped or re-dyed, and because what is said of them is generally applicable. Packages that can be successfully dyed with these classes of dyestuffs should present no different problem when dyed with other classes of dyestuffs.

In the analysis of a package, there are five important measurements. These measurements are:

1. Weight
2. Dimension
3. Yarn Count
4. Angle of Wind
5. Density

WEIGHT

Dyehouse production is based on pounds of yarn, and the package is the smallest unit of that production. The simplest way to increase production is to increase the weight of the package. But we cannot increase the package weight without a careful study of dimensions, yarn count, angle of wind and density. These factors limit the weight of package we can dye level with a light shade of a rapid exhausting color. Any improvement that will increase the level-dyeing properties of a package will open possibilities of dyeing a heavier package and thereby increase production. The average package weight is important but maximum and minimum tolerance should be specified. With properly controlled winding, plus or minus one-quarter ounce is tolerable. While there can be little discussion about weight, the main purpose of examining the other factors is to increase the weight of a level dyeing package.

DIMENSION

The two important dimensions are height and diameter. The diameter is limited to less than the distance between spindle centers because the packages must not touch. In height, the so-called six-inch packages have become more or less standard except for fine yarns. Fine yarns on a six-inch package present unwinding difficulties, so a small package is used. The perfect package might be defined as "the largest and heaviest package that can be dyed level with a light shade of a rapid exhausting color."

This definition standardizes the weight and dimensions of a package, but it is incomplete without an examination of yarn count, angle of wind and density. It is a serious mistake to specify the dimensions and weight of a package without specifying the angle of wind and density, because they have an important influence on the size and weight package that can be dyed level.

YARN COUNT

Yarn count may vary from multi-ply hard twist coarse yarns to very fine soft twist single yarns. The process is very flexible, but it would be misleading to suggest that certain standards would be suitable independent of yarn count. Definite modifications in package preparation can be suited to any particular yarn count. Ply yarns, particularly hard twist ply yarns, should be wound softer than single yarns.

ANGLE OF WIND

Angle of wind, or the lay of the yarn, can be derived by the formula:

$$\cos a = \frac{\pi (D)}{P}$$

Where "a" is angle of wind
Where "D" is the diameter
Where "P" is the pitch

Angle of wind merits more consideration than it has received. It is impossible to discuss the other factors of a package without including angle of wind.

A package can be described as a cylinder of yarn with a hollow core. To retain its form as a cylinder and withstand handling and processing the yarn must be wound on an angle. In practice, from 6½° to 21½° angles have been used. The angle of wind has a very definite effect on the dyeing qualities and the size of a package that can be dyed level. A flat angle of wind builds a package of even density with soft ends, but limits the package size because it lays the yarn too parallel to permit a free flow of the dye bath. The wide angle, on the contrary, builds a package of uneven density with hard ends and limits the size package that can be dyed level. This leads to the conclusion that to wind a perfect cylinder of equal density the degree of angle of wind is limited by the delay of wind-reversing at each end of the stroke. This stopping and reversing forms a knuckle of yarn at each end of the package. With a wide angle of wind these knuckles build faster than the rest of the package and make hard ends and critical dyeing areas. This is the greatest source of trouble from the present vogue of open angle winding. It is the common practice in many dye houses to crush the packages, forming elliptical ends, to facilitate dye penetration in these areas. This crushing has the effect of shortening the pitch on the outside of the package and closing the angle of wind where an open angle of wind would be most desirable. Another source of trouble from a wide angle wind is from "cross overs." A "cross-over" is a white or unpenetrated spot on the yarn where it crosses over another thread. The examination of packages leads to the observation that the same angle of wind is generally used, regardless of whether a coil spring or perforated tube is used for a core. The method of kettle loading these two types of packages makes questionable the wisdom of using the same angle of wind for both packages. The coil spring wound packages are placed in a column on a spindle and compressed, often closing the angle of wind 25 per cent, while the perforated tube packages retain the original angle of wind throughout the dyeing period.

The method of pumping the dye bath through the package is relatively the same, and, if there is 25 per cent difference in the angle of winding under dyeing conditions, one or the other must be wrong.

Most of the modern winding machines are winding with wide angles, but from a dye house point of view there is no advantage to compensate for hazards and disadvantages of this type of wind. The best angle of wind is that angle that permits the largest package to dye level with a rapid exhausting color.

DENSITY

Density is compactness of wind, but density, as far as yarn preparation is concerned, has been merely a word. Pressure kettles show amazing flexibility, but no one would expect a kettle loaded with packages of various densities to dye all the packages level and the same shade.

The usual method of determining the density of a package is to grasp it firmly in both hands and probe with the thumb and fingers, and from there on the density depends on the grasping strength of the individual. This is not a satisfactory test. It does not answer the question of what is the best density for dyeing. If, on dyeing, the so-tested package proves to be the best density, there is no permanent record of it. What has proven a better method of testing density and making a permanent record of it, is to mount a presser-foot gauge on a firm stand and use a positive weight of pressure. With a button point and a two kilogram weight we take the average of five tests and can duplicate results with a plus or minus 5 tolerance. It is unreasonable to expect any winding machine to stay within this tolerance from spindle to spindle. Properly supervised, it is possible for them to wind any given yarn count within a tolerance of plus or minus 15 the year round. There is no discernible difference in dyeing results within this tolerance.

We have used this method for several years with excellent results. It is a positive check on whether the winding room is being merely operated or supervised. There is no reason why a dyer cannot specify the density and weight of packages of any particular yarn count, and get exactly what he wants. The responsibility of the winding room ends when it delivers the packages as specified, and it might be added, this greatly relieves the responsibility on the dyer. A study of winding results explodes the old saw that change of season or temperature varies the package density outside allowable tolerance. When there is an alarming change in the density there is a better reason for it. For example, it may sound fantastic to say that the reason a high cost dye batch is streaky is because the yarn was slubbed, but that may be the reason. Slub catchers mounted on package winding machines can cause varying densities.

Density or the compactness of yarn may be regarded as the product of tension, speed of wind and yarn count. (Tension in this case is used in its broadest sense as being the sum total of all tension, regardless of source). With

the same tension, yarn count and speed of wind, the resulting density should be within a reasonable tolerance, and no discernible difference in dyeing should result. Any change in yarn count, tension or speed of wind will give a different density. It can be worked out that any change in yarn count can be compensated for by a change in tension so that the density will be the same for all yarn counts if it is so desired. In the case of single yarns it is desirable to have one standard of density, but this is not true when comparing a single yarn against a ply yarn. The best density for a 10/1 yarn, for example, would not be best for a 20/2. If there is more shrinkage in the ply yarn, allowance should be made for it by winding a softer density. It is often difficult to get the co-operation of the winding department to abandon its haphazard production to a controlled method of yarn preparation, but it greatly increases production and improves quality at lower costs all along the line.

In setting up a method of testing density with a presser-foot gauge and standard weight, we assumed that zero density is the hardest package that can be wound with a given yarn count. The other extreme, the softest density, would be the loosest wound package that can stand handling and processing. On our instrument, the density index of this soft package would be about 500. Within these two extremes, 0-500, it is reasonable to expect to find the best density for dyeing and handling. Our observation indicates the best density for most single yarns is about halfway, in a zone of 250-300. Any package of lower density number will impede the flow of the dye bath. For ply yarns, particularly hard twist ply yarns, a softer density is necessary to allow for the natural take-up or shrinkage in a water bath. Yarn count is an important factor in density, and no figure can be given independent of yarn count.

Rather than a standard figure of density, it is more practical to set up a zone of density. In a scale of 0-500, this zone would be in the upper half of the scale, with most soft twist single yarns falling in the 250-300 area, and the hard-twist ply yarns a hundred points higher.

All density tests should be made previous to dyeing.

In setting up a zone of density the method of kettle loading is a factor. The density and angle of wind is not changed in the dye kettle when the package is wound on a perforated tube, but when wound on a coil spring and compressed in the dye kettle, both the angle of wind and density are changed. This leads to the assumption that the best density for a tube-wound package is not the best density for a package wound on a coil spring. It is impossible to state what the difference should be without knowing how much the coil spring package is to be compressed.

The examination and study of packages of yarn prepared for dyeing was made on sample packages from mills in various parts of the country. In some cases duplicate tests were made on packages from the same source. This meager sampling cannot be considered an average sample of any plant's production. However, the average sample is not as interesting or as disturbing to a dyer as the extremes. A few of these packages will suffice to demonstrate why pressure dyers cannot discuss their problem on a common ground because the package problem of one may be unlike the others.

Keeping in mind the five important measurements; Weight—Dimension—Yarn Count—Angle of Wind—Density—let us compare some specimen drawings. It will be noticed that the dimensions, particularly height, vary. For the purpose of comparison, we will divide the weight by the height and get the average weight per inch. This inch weight figure can be used regardless of package size for comparison of weight.

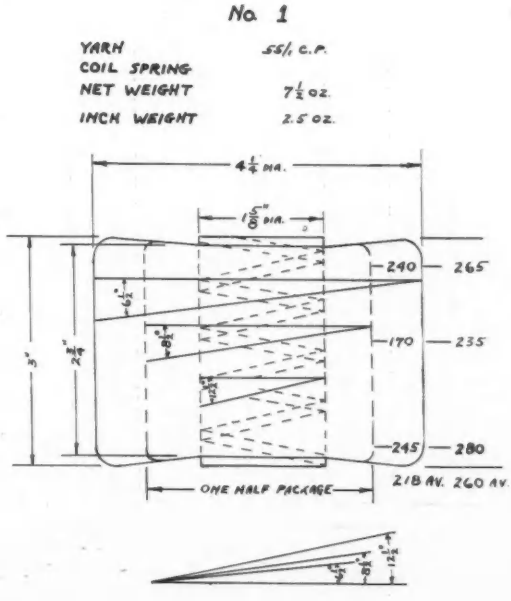
NO. 1

This is one of the older types of winds and was used for years in building packages for pressure dyeing. Many thousands of pounds of this type of package have been processed.

This is a three inch package of four and one-half inches diameter. This yarn (55/1) can be dyed equally as well on a six inch package, but the three inch package gives better performance in warping and filling winding, following dyeing.

The glaring fault of this type package is the freak angle of wind. Starting at the spring core with a 12½° angle, it progressively closes to 6½° angle on the outside of a four and one-half inch diameter package, in spite of the increase in pitch from two and three-quarters inches to three inches. If this package were wound an inch larger to a five and one-quarter inch diameter (a common diameter for packages of this yarn count) and the same progression continued in the angle of wind, we would have an unthinkable angle of 4.21°.

This filter-like build will impede the flow of dye liquor and definitely limit the package to a small size that can be dyed level. This is reflected in the inch weight of two and one-half ounces and the low net weight of seven and one-half ounces.

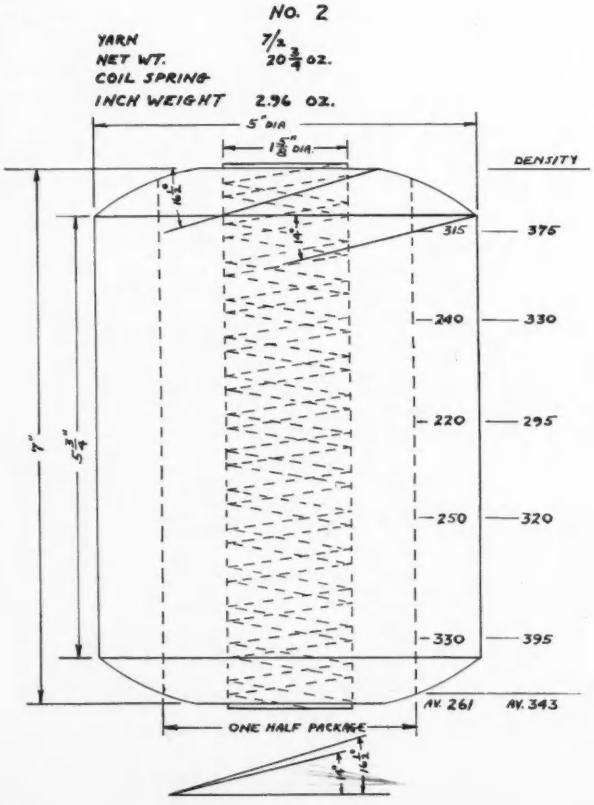


The average of three density tests made on the outside of the package is 260. This is a good density and comes in the proper zone for this yarn count. A second test was made when the package was one-half unwound. This is used as a check on a trend and also to check the angle of wind. The average of the second density tests in this case is reasonable, and the trend toward a softer package as it grows larger is a good one.

This package is an excellent example of improper yarn preparation. The inherent fault of this package cannot be overcome by dye bath manipulation. The correct solution is to abandon this type of wind for one that can be dyed level in larger packages. Until this correction is made, the dyer's only escape is to keep the package size small. Without any change in dye bath control, 50 per cent larger packages of this yarn count can be dyed if a better angle of wind is used.

NO. 2

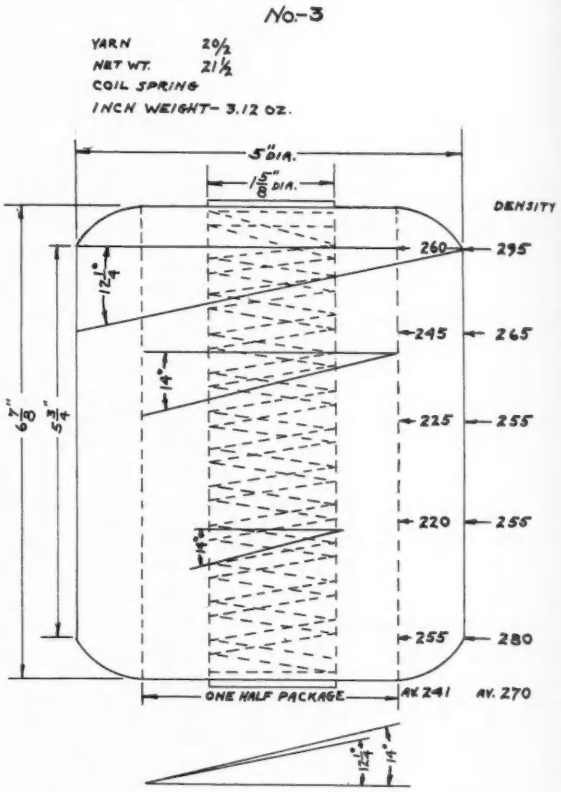
This is a coarse (7/2) yarn wound on a so-called six inch coil spring (actually it is seven inches). The starting angle of wind at the spring core is 16½° and it closes to a 14° angle on the outside of a five inch diameter package. The elliptical curved ends are too smooth to indicate this angle change is caused by cupping or crushing the ends. There is a natural shortening of pitch when little or no tension except air friction is used and the soft average density number of 343 indicates little or no tension except air friction. A 16½° angle of wind is entering the zone of hard ends unless the density is very soft. With a lower density number, penetration of these areas become a problem.



The density average is good for this type of package and yarn count. The outside average density of 343 and the one-half size density average of 261 denotes a very desirable trend toward increasing softness as the package increases in size.

NO. 3

No. 3 was wound on the same equipment as No. 2. The dimensions are almost the same but there is a change in the net weight, density and angle of wind. The net weight increases because of lower density index and harder package. There is too much of a change in the angle of wind for any reasonable explanation.



Duplicate kettles loaded with these two packages would not give the same dyeing results. Unless the dyer were cognizant of this change in density and angle of wind and took steps to avoid the hazard, it could mean a poorly penetrated and streaky dye batch.

It might be pointed out that there is an escape feature under certain conditions. Packages wound on coil springs are dyed in a compressed column of several packages. By loading one less package in the column of a large kettle holding eight to ten packages per spindle, less compression of the column would approximate the dyeing condition of package No. 2. However, this means a kettle production loss of 10-15 per cent. With a small kettle with short spindles holding three or four packages it would be impossible to cut the spindle capacity as much as one package.

(Continued on page 367)

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

JULY 20, 1942

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Members should notify the **Secretary** immediately of all address changes.

ANNUAL OUTING
RHODE ISLAND SECTION
June 12, 1942
Pawtucket Golf Club, Pawtucket, R. I.
Photos by N. A. Johnson

ANNUAL OUTING, RHODE ISLAND SECTION

THE Rhode Island Section held its annual Summer outing at the Pawtucket Golf Club, Pawtucket, R. I., on June 12th. Over 400 persons attended and almost half of these, or 180-190 players, enjoyed golf during the afternoon. In the evening, an old fashioned Rhode Island clambake was served under a large tent on the Pawtucket Golf Club grounds. Prizes were distributed winners at golf and others to members and guests.

Congratulations are due to the committee for their handling of the affair. F. L. McCool was chairman and he was assisted by A. N. Graves, D. F. Gifford, E. J. Allard, W. A. Lord, and E. H. Aspinwall. The winners of the golf prizes were:

Members

1st low gross, Ralph Howes; 1st low net, D. Gifford.

2nd low gross, Bob Brewer; 2nd low net, Bill Corr.

3rd low gross, B. Fernald; 3rd low net, Bill Robinson.

4th low net, W. Cook.

1st nearest to pin, G. Holdsworth; 1st longest drive, A. B. Baner.

2nd nearest to pin, F. Maher; 2nd longest drive, Wm. Brown.

Most 5's, Ed Gamble; Most 6's, George Wood; Most 7's, E. Rivers.

Guests

1st low gross, W. Robertshaw, Bill Law (tied, each given a prize).

2nd low gross, George Stevens, Bill Darlington (tied, each given a prize).

1st low net, S. Robertshaw, 2nd low net, H. Stevens.

Respectfully submitted,

R. W. JOERGER, *Secretary.*

ANNUAL OUTING, PHILADELPHIA SECTION

THE annual outing of the Philadelphia Section was held on June 12, 1942 at the Manufacturer's Golf & Country Club, Oreland, Pa.

James Dixon was awarded the Alban Eavenson trophy for having secured the lowest golf score of eighty-one.

Despite the inclement weather, 365 persons attended the outing. A number of prizes were awarded in the usual manner at the dinner which was held at 7:00 p.m. This was followed by delightful entertainment.

The committees who worked to make this annual outing a great success were—James P. Conaway, Boyce C. Bond, Arthur E. Jones, George E. Kohn and Walter G. Hamlen.

Respectfully submitted,

BOYCE C. BOND, *Secretary.*

ANNUAL MEETING CANCELLED

AT the last meeting of the Council, held in New York City on June 27th, a resolution was unanimously adopted cancelling this year's Annual Meeting, which was scheduled to be held in Atlantic City on October 8 to 11, 1942. This step was taken at the suggestion of Joseph B. Eastman, Director of the Office of Defense Transportation, in keeping with the government's policy to eliminate all conventions which involve extensive travelling on the part of delegates. The Council is glad to co-operate with the wishes of the government in this respect but regrets that the Technical Program which was planned for the Convention cannot be held, because it was to be devoted entirely to the technical aspects of the nation's defense effort insofar as the textile industry is concerned.

The Council voted to continue the Intersectional Technical Contest, which will be conducted by the publication of the various contest papers in the Official Proceedings of the Association. Each section's contribution will be judged by the staff of elected judges and winners will be announced in a subsequent issue.

MEETING, SOUTHEASTERN SECTION

THE Southeastern Section held its summer meeting on Saturday evening, June 6th, at the Atlanta Athletic Club in Atlanta, Ga., with an attendance of more than 100 members and guests. There were two speakers: Rev. Pierce Harris, pastor of the First Methodist Church of Atlanta, and a former professional base-ball player, spoke on "Citizenship in a Crisis," and Col. L. O. Grice, of the Quartermaster Corps of the U. S. Army, Washington, D. C., discussed problems involved in the dyeing and finishing of fabrics for army use. After Col. Grice's talk there was a session of informal discussion on the subject.

Plans are well under way for the preparation of this section's paper in the Intersectional Contest.

It was decided to hold in abeyance plans for further meetings of the section this year until the transportation situation and other current difficulties are more clearly defined.

Thomas A. Davis, treasurer of the section, has joined the armed forces, and George L. Dozier, 100 Wright St., Marietta, Ga., representative of Sandoz Chemical Works, was selected to serve in this capacity during Mr. Davis' absence. George H. Small, of Atlanta, southeastern sales manager of National Oil Products Company, has resigned as a member of the sectional committee, and Joseph W. Richardson, superintendent of bleaching, Russell Mfg. Co., Alexander City, Ala., has entered the military service in the Ordnance Department.

Respectfully submitted,

LEE L. BAKER, *Secretary.*

Modern Fabrics: Their Handling, and Troubles Encountered in the DRY CLEANING PLANT

I. PAUL

General Manager, Kent Stores, Inc.

IT has been the belief of dry cleaners that the men who conceive the new constructions and the new fibers which make for new and modern fabrics, and the men who design color and motifs, sometimes seem to forget the function of the dry cleaner. The success or failure of a fabric depends upon consumer acceptance, and, in the last analysis, a good deal of consumer acceptance is based upon the opinion that is molded by the dry cleaner. Dry cleaning, as you all well know, is fairly universal. There is hardly a person that doesn't use some phase of it. If a garment is brought to a dry cleaner, and if, when that garment is returned, it is faded or the fabric is twisted out of shape, the most plausible excuse for the cleaner is to blame the fabric.

So, with a modern fabric, the test of consumer acceptance should definitely contemplate whether or not it will stand the rigid acid test of dry cleaning. In analyzing modern fabrics and how they react in dry cleaning, we must know two basic things: First, we should know the dry cleaner and, second, we should know the dry cleaning process. I will put the cart before the horse and start off with our dry cleaners.

THE DRY CLEANER

The dry cleaning industry is a very substantial one. Its use is in every nook and corner of the land. Its volume runs into hundreds of millions of dollars. The unit of operation, the business size of the respective individual who owns or runs a dry cleaning plant, is mighty, mighty small. Take as a typical illustration the metropolitan area of New York. We have, including the little plants that you see in those corner stores, about 400 plants in sum total, together with approximately 15,000 tailors as feeders to many of these plants. Taken into consideration in this figure are those plants that operate stores, and laundries that do their own dry cleaning. The average of these plants does about $50,000 or $60,000 a year. So you get a comprehensive picture of how small the individual operator is. Our own organization is an exception, being the largest in the country, doing about $2,000,000 in sales annually.

The point I make is this: that the technicians in the dry cleaning industry are basically practical men. I don't know of a single technician, operator of a dry cleaning plant, or a man who works in the dry cleaning plant proper, who can boast of a college or a university background of chemistry and physics, the subjects that seem so absolutely essential in the handling of what is fundamentally a chemical process. These men have gotten their knowledge the hard way. They have learned it from the men who worked alongside of them. They know a given process, they have a given groove. They have no research chemists to improve upon their processes. They basically rely upon trade salesmen to tell them how to improve. They have been so often imposed upon with half-baked ideas that the cleaner is a sceptic.

I paint this picture because that is the man who is dry cleaning the garment made of the fabric to which you gentlemen are in some way related in its original manufacture or design.

The dry cleaner knows one method. He must be practically "conked" on the head before he is moved to try a different method. That is almost universally true. His background and training has developed this outlook. There is just a single school that I know of where men are trained for dry cleaning plants. That is maintained by the National Association of Cleaners and Dyers in Silver Springs, Maryland. Men are trained there for the practical. You need not have a background of chemistry or physics to take the course.

Just how has this background of the personnel affected the dry cleaning industry? The first impression, of course, would be that we are still doing the same things our grandfathers did. That answer is wrong. The entire industry has been in a tremendous state of flux. Methods have been rapidly changing in the last ten or fifteen years, almost as rapidly as the textile industry itself. The reason for it is comparatively simple—necessity has become the mother of invention or remains to be such.

Our own experience at the Kent plant is typical. I frankly tell you I have no technical background. I can't discuss in great detail the chemical composition of a host of the products we use, but, as I will show you, many of the new problems that confronted our plant in its growth made for changes in the processes used in the dry cleaning

*Presented at meeting, New York Section, March 27, 1942.

end of it. I shall discuss these changes in my talk of the dry cleaning process.

So much for the first perspective—know your dry cleaner. I have tried to give you a brief background of the men who dry clean the millions of garments every year in this country.

THE DRY CLEANING PROCESS

Now! What about the cleaning process? I am going to describe to you, in a very simple way, just what dry cleaning is. As I frequently have told customers, there is nothing involved about it.

Dry cleaning is washing your garments in naphtha. Of course, we don't use straight naphtha today. We use a petroleum derivative, known as Stoddard Solvent. However, your garments are taken, very much like in the laundry, and put in a cylinder which is partially filled with this solvent. I might add at this time, as an indication of how much the dry cleaning industry has been in flux, that back in 1925 the great portion of the plants used ordinary gasoline, the very stuff that we use to run our automobiles.

Let me halt here and give you a very simple idea of how it is worked. It isn't so very long ago that the high price of dry cleaning induced many women to go to their neighborhood paint stores, and buy several gallons of naphtha. They would take it home, take out two pails that they might have used for scrubbing the floors, clean them properly, and place half of the naphtha in one pail and half in another. They would then take the dress that they desired to dry clean, put it into one pail and proceed to rub the dress. The friction and agitation caused the loosening of the soil. What was the action of the naphtha? Well, it dissolved the greases and the oils, and released the dirt that was held intact by that oil. As they dipped the dress up and down and rubbed it, the crystal clear naphtha gradually turned black. Then they finally rinsed the dress and placed it in the second pail, and dipped it half a dozen times up and down to give it a rinsing. Then they shook it out and hung it on a line.

That, gentlemen, is the simplest form of dry cleaning. That is all it is.

Of course, you can compare that with the old-fashioned washing of clothes on the scrubbing board. Dry cleaning has since developed a long way from that simple process which I have outlined. It is likewise true in dry cleaning today, that we have large cylinder machines, where 300 dresses are placed in a single machine. We fill it up about one-third with this solvent, and then we rotate the garments in these closed cylinders for about fifteen minutes to loosen the dirt. Then the solvent is drained away and the cylinder is filled up again with clear solvent. We introduce a soap and again run it for a short period of fifteen or twenty minutes.

I give you a process that is used in the main by the great majority, although many have other methods but they are merely a digression in form. Basically they are the same. We introduce ammonia for water soluble stains and then proceed to run the garments for another hour. During this time, of course, the solvent gets very black and instead of drawing away that solvent and getting another batch up, we have introduced the use of filtration. That, too, is simple. As the garments are rotated in the solvent, a pump is turned on. The solvent is forced by the pump into a series of screens where the alien substance and the dirt are captured by the screen, and the cleaned solvent returns to the machine.

After the lapse of a given length of time, the machine is stopped, the work is extracted through the use of a centrifuge, and then it is deodorized or dried in what is known as a tumbler.

All that process has done, as I have pointed out before, is to dissolve the grease and the oils, release the dirt, and the introduction of the ammonia has attacked and removed some of the water soluble stains, but not all. So that when the garment is mechanically dry cleaned, it isn't yet completely dry cleaned as the customer knows the process. For illustration, you may have gotten a suit back from the cleaners and, when you looked at it, found a stain on the lapel. Then you have condemned the dry cleaner and said it was a poor job. It might have been a perfect job of dry cleaning, but many of the stains were not removed, because they were never destined to be taken off. I shouldn't have really said that—they never have been taken off in that process.

After mechanical dry cleaning, every garment must be inspected by a technician known as a spotter. Many years ago, when I first came into the industry, my initial sight of a spotter was a man who had a table very much like a pressing board, which had a little nook and corner, a square board of 12 by 12, containing 30 or 40 bottles of all kinds of chemicals. If you dared ask him what the different chemicals were, he would look at you awry, and give the impression, "You don't want me to tell you trade secrets, do you?" But if you watched him slyly, you would find that 98 per cent of the times he used only two or three of the chemicals to do his chores. Once in a while he would pull out some of the chemicals to make a little smoke appear and give the boss the impression that he was doing a swell job.

It may sound paradoxical, but I am not trying to slam our dry cleaning business, but in those days one of the few unions within the industry was the spotting union. Wages obtained by men in that category were approximately $125 a week or thereabouts. They kept the field comparatively limited, and of course it was one of those chosen things that father handed down to son.

Today most of the spotting, as I have told you, is done with two or three chemicals. Every garment is examined and an attempt is made to remove stains that have not come out in normal dry cleaning. What types of stains are they? Oh, a host of them, running from fruit stains

right through to sweet stains, such as chocolate stains. Very frequently the spotter comes to the conclusion, after a garment has been thoroughly dry cleaned, that it must be wet cleaned, i.e., washed.

Why does the spotter recommend a garment for washing? It is true that the washing process accounts for a great portion of the cleaner's ills. Washing is recommended because it is necessary.

We will take the simple illustration of the boy and girl who go down to the local drug store, and in the tomfoolery that sometimes takes place, someone spills a whole ice cream soda over the front of the dress. It is then taken to the dry cleaner, and after the garment goes through the mechanical operation, it comes to the spotter. The spotter finds a beautiful spot that starts at the neck and winds up a the skirt. Water will take that out, but if we start to remove that stain with water, we are going to have a water impression from the top of the dress to the bottom. We have found from experience that in washing, many dyes will lighten or fabrics will shrink. Therefore, it is far better to take the entire dress and immerse it in water, and have uniform shrinkage or uniform lightening of the colors, to the end that the dress may be presentable and wearable again.

In our own plant, our experience has been, over-all, that about 10 per cent of our garments are wet cleaned. Wet cleaning, of course, is the big bugaboo of our dry cleaning business. It presents the greatest portion of all of our troubles. There will be shrinkage and there will be running of colors. We simply try our level best to keep such occurrences to a minimum. Many of the so-called very fine plants would measure each garment when it came in and measure each garment when it went out. We have found from long experience that as a practical method it doesn't exactly work, and I will tell you why. We have come to the conclusion that it is just as well to let the garment shrink. Use whatever preventives you can to reduced the amount of shrinkage, and then try to return the garment to its normal shape by air blowers.

I could take the process of finishing and go into marked detail, but you are not interested primarily in that. However, I do want to point out at this time that our industry has been in marked flux, and we, as one of many thousands that operate a dry cleaning plant, have designed many of the methods which we and many others now use.

For sake of illustration, when we first came into this industry back in 1929, the machines that were used to clean dresses, as practical equipment, were small washers. The diameter of the average shell might have been two or two and a half feet. Of course, 25, or 30, or 40 dresses were pretty much tops for a single load. We ran into a disastrous experience one week before Easter. We didn't have enough equipment to turn out all the dresses that had come our way, and in an act of desperation, we took 300 dresses and threw them into a machine where we had only cleaned men's coats before. The diameter of the cylinder was approximately four feet. That meant that as the cylinder rotated up and back, the garments would have a drop of four feet. We crossed our fingers and hoped that nothing would happen to the fragile silk dresses.

When we took the garments out we found that the friction of the large drop, the chafing action of one garment against the other, had done a far superior job than the old small machines that we once used. The result was that all small washers "went out the window."

Now I think you will find that the machinery concerns selling to the dry cleaners throughout the land rarely sell a small washer except to some very, very small operators. For any sizable plant, there are but large machines, because they have learned through experience the value of such machines. Necessity is truly the mother of invention.

So, too, with that process I described to you of spotting—the man that had all those chemicals. Today, we have a battery of 20 girls. We have had the privilege of having some of you gentlemen out at our plant doing certain of your research work, and in the course of the last two or three months you have seen us take that spotting department and completely change its entire approach. Where we used, basically, two or three different chemicals to remove most of the stains, we removed those chemicals from the hands of these 20 girls. Today, all they use is a steam gun. It employs dry steam. Such steam hasn't much moisture, but just enough moisture and enough pressure to break up the spot.

What changes will come in the course of the next year or years no one can tell, but one thing is quite certain, that in creating modern fabrics I think it is only sound that you test them in the light of existing methods of dry cleaning.

I have seen in many instances where effort is made by the manufacturer to safeguard against possible abuse to a fabric that may not be able to stand up under some of the rigorous processes of cleaning but to no avail.

Just what do I mean? I have seen any number of flannel trousers that come in, with beautifully woven labels, "Do Not Wet Clean, Do Not Wash." That doesn't mean a thing to the cleaner, not a thing. (Laughter.) I will tell you why. Take the case of the enthusiastic dad who spent a day in the country with the family. A grand time was had by all. Pick-a-back and rolling in the grass marked part of the day's activities. When the flannels came in to us, they had the green of the grass from the seat right down to the cuffs. Dry cleaning couldn't take out the green and that fellow never could have worn that pair of pants again unless the trousers were wet cleaned. So, of course, we had to wet clean the flannels with all the care that we could, despite the admonition of the manufacturer, "Don't Wet Clean."

By the same token, many fabrics that may look beautiful when made into a dress have turned out to be a veritable

boomerang to the original selling organization. Perhaps the best illustration of that is some of these jersies we have been handling of late, which just seem to pull right out of shape. I remember one complaint on a jersey dress. With all of our steaming, we managed to get it back into shape again. Then the customer came in, looked at the dress and tried it on. We gave her a credit for her trouble and parted friends. We said to ourselves, "There goes a well satisfied customer." Two weeks later, the same woman is back in the store, but instead of a smile she has a big long face. She has let the garment hang in the closet. Later she found the bottom of it resting on the floor. (Laughter.)

Of course, we do make our mistakes—all of us do. We have a very definitely limited knowledge of the chemical composition and the background of the many processes that we use. Perhaps the fact that we stay close to the narrow path of a given and successful process until it has been definitely proven that something else is better is some assurance at least to you who are on the originating end. However, I again say that these many new fabrics—particularly the fabrics that are to come; fabrics made of milk and a host of other things, including the various rayons, should definitely be tested from the dry cleaning perspective before they are put into commercial use. I sincerely extend to all of you an invitation here in New York to use our facilities as often as you like. In so doing we are not just good fellows, but we are trying to lessen our headaches and our troubles, too.

My parting shot is this: Do use those facilities, let us put it through our simple tests, draw your own conclusions, and thus we can solve a great many problems on modern fabrics in dry cleaning.

DISCUSSION

Chairman Tisdale: A thought occurred to me while you were talking, as to whether dry cleaning, as an industry, was separate and distinct from the laundry industry. Is there a distinction there, or do they go together?

Mr. Paul: It is only fair to say that the laundry and dry cleaning industries are so closely allied and related that when you talk of one you should think in terms of both, although the processes are materially different. The reason I say that is because of the fact that the greatest majority of laundries do dry cleaning and a large portion of dry cleaners do laundering. In our own particular instance, we launder only one thing, and that is shirts. We launder somewhere between 75,000 and 80,000 shirts a week. However, both the processes and the general character of the machines used are similar. The basic difference, of course, is the use of the solvent as distinguished from water. Does that answer you?

Chairman Tisdale: It brings up another question in my mind: You spoke of the apparent lack of scientific training of the operatives in the dry cleaning industry. I was under the impression that as far as the laundry is concerned, they did use the most modern methods that scientific knowledge could produce.

Mr. Paul: The laundries have made unique progress, far exceeding that of the dry cleaner. They have their own independent national association at Joliet, and I understand they have done some splendid work in research primarily. The dry cleaners, on the other hand, have not been quite as fortunate and there hasn't been the stability of process in the dry cleaning industry as there has been in the laundry industry.

Perhaps the greatest advance in the dry cleaning industry in the last 20 years has been the conversion from the use of ordinary gasoline as our solvent to what is known as the Stoddard Solvent. The name, Stoddard, comes from the name of the President of the National Association of Cleaners and Dyers. That was a product of Mellon Institute work. What it really did was this: At first, we used gasoline. We found that some of the more volatile petroleum products would do a sharper and better job, such as naphtha. The only difficulty with naphtha was that its low flash point created a great hazard. The average dry cleaner didn't know whether he was in business from day to day. Ordinary static electricity would set off the sparks, and if a dry cleaner didn't have at least one fire a year he couldn't wear his chevrons properly.

The Mellon Institute, about 15 or 16 years ago, took the same petroleum base, the same naphtha, and introduced certain heavier oils, raising the flash point to a hundred degrees. The result was that fires have almost been eliminated from dry cleaning plants within the scope of the use of the solvent. We still have fires, but it doesn't come from the use of the solvent. It comes in the drying process, where the temperature ranges anywhere from 120 to 150 degrees. We sometimes run into fires there caused basically by friction.

However, very few advances of that character have come from within the industry. I don't want you to misunderstand. The Laundry Institute has done a splendid job. I am finding no fault with our own National Association, but it just seems that it hasn't quite gotten out of its teens yet.

Mr. Wood: Mr. Paul, I remember a good many years ago nearly all the dry cleaners described themselves as dyers and dry cleaners. I think at one time it was quite a common thing when anyone died in the family for people to send out suits for everybody in the family and have them dyed black. Occasionally they would have suits dyed from one color to another, and the same thing with dresses. Has that passed out of the picture altogether? Do the dry cleaners only dry clean now, or do they still do dyeing?

Mr. Paul: That is a very difficult question to answer, although on the surface it doesn't seem that way. There is a tradition to the business of dyeing, and we are very fortunate in having one dyer. We, the largest cleaners in the business, have one dyer, and we have considerable

difficulty in keeping him busy all year around. He learned his business from his father, who in turn learned it from his father, who in turn learned it from his father, and he knows his business and knows it well.

Dyeing as such is almost completely out of the picture, and the death knell was sounded with the introduction of your synthetic fabrics. That just killed it altogether, because when you have to go out and spend $2, $3, or $4 a pound for some dyes, there is always the human tendency to try to convert the fabric through the use of caustic and turn out a poor job.

The result is that generally speaking most cleaners discourage dyeing. The price in the last 20 years has been placed at a level which, with the rapid reduction in the cost of garments, has led to the point where it doesn't pay the average woman to dye a garment.

With reference to men's suits even today we all know that in the manufacture of a man's suit you may have wool on the exterior, you may have cotton in the padding, and then you may have a rayon lining. You don't take the suit apart. You take the whole suit, drop it in the vat and dye it that way. The action of the process varies with the different types of fabrics. The result is not good in most instances.

Generally speaking, we discourage dyeing, and I don't know of a single cleaning concern where dyeing constitutes more than 10 per cent of its business. It seems that is not true in other countries. We have an associate concern in Montreal, Canada, where it is doing a very substantial job of dyeing. Generally speaking, these are garments made of English woolens and the like. The dyers go to greater pains. Frequently they rip the entire suit apart, dye it, and put it together again. Until this war effort started to take its toll of men, the cost of labor in Canada was substantially less than here, and they could afford to do those things. With our high-powered production methods, we can go into a store and buy a fairly likable suit very reasonably. At the price that they charge, it certainly wouldn't warrant anyone to pay $7, $8, or $9 for dyeing and then get a suit that looks like it wouldn't fit.

I found that same condition true in England some years ago, when it was common practice to have a suit turned. Turning a suit meant—well, you would take it down to the cleaner. He would rip it apart, pull every thread out of the thing, and then, turn the cloth inside out and then make the suit all over again. (Laughter) There is only one trouble with that. As one chap was telling me some years back when I was over in London, the suit looked swell, but he had to bend down to get something off a bottom shelf and the back seat went "Z-i-t." He kind of figured that even though turning was good, when the wool wore it wore, and turning it didn't give it any more life.

Mr. Knowland: Is there any radical difference between a dollar job and a 39 cent job of dry cleaning?

Mr. Paul: That question and one other question I hoped I might be able to duck. (Laughter) I might say at this time the other question was, "Where do you have your own suits dry cleaned?" (Laughter)

Frankly speaking, there is very little difference. I guess you would expect to hear that from a cheap cleaner, but honestly and truthfully, the most expensive cleaning has always been the poorest cleaning, and the cheapest cleaning has always been the best. Let me explain that to you. It is like the fellow who said, "I have made my millions because I always sell cheap and pay high when I buy." Someone said to him, "Well, how is it possible, if you sell cheap or low and pay high when you buy that you could amass the fortune that you have?"

He said, "Very simple. When everyone is out selling like mad, I buy and pay high in that market, and when everyone is out scrambling to buy, I get rid of what I have, sell it cheap to get rid of it. So I manage to buy high and sell cheap, and that is how I have made my money."

The same thing is true of dry cleaning. The cleaning action that I have tried to outline simply is basically mechanical. Three hundred garments at a crack and doing that job well consists of two things: first, seeing that your garment gets its proper treatment; you run it long enough and use the proper soaps. The second thing is the care that you give that solvent. Unlike laundries, we don't take our water and throw it away. We never throw away any solvent. Our own plant replenishes solvent to the tune of 4,000 or 5,000 gallons a week. That is almost entirely lost through evaporation. But as for the residue, after we have used it, we clean it, baby it, take care of it, and we do that in three distinct ways: One, which I outlined to you before, is that in the process of cleaning we filter the solvent. That doesn't take out many of the soluble chemicals that get into the solvent. We use a chemical treatment, a caustic treatment, where we take the solvent through a bed of water and caustic. The saponification action resulting, removes the fatty acids from the solvent.

After we take it through that bath we take it through a distillation process. The proper care of solvent restores its vitality and makes for a better cleaning job. It is simple enough to do. It means care and trouble. I mean, taking the trouble to do it right. Many plants, when they are overloaded will continually use the same dirty solvent over and over again. Many plants will use one process of cleaning it and the solvent will look crystal clear, but it has certain insaturates in it, or certain fatty acids. I have heard any number of people complain that at places where they had paid high prices the garments had a peculiar smell. That was the rancid odor of the fatty acids that had accumulated and built up in the solvent. The cost between doing the mechanical job right and doing it wrong is so negligible that it is foolish to do it wrong.

Of course, just the mechanical action of dry cleaning

doesn't make for the entire dry cleaning job. We have the element of spotting, and we have the element of finishing.

In our own particular plant on two occasions we had the privilege of helping out a neighbor who had a huge plant. They have the reputation of being a quality chain. We did their work on one occasion for well over a month. We had dresses there for which we were charging 39 cents, and alongside of them were dresses for which $2, $3, and $4 was being charged.

Was their cleaning any better? The mechanical cleaning was identically the same. The spotting was substantially the same. As to the finishing, the pressing, the snaps, the buttons, tacking up the hemlines—they did a better job than we did, and that made the difference. We maintain—and I say it sincerely—that we do 95 per cent of the job that anyone else does. We don't and can't take the fine pains in finishing that is taken at a more expensive establishment.

Let me make this point so that you will understand what I mean. We have approximately 200 pressing machines on one floor. One man may press nothing but navy blue trousers all day long; that is all he does. Another man may press jackets. A girl may do nothing but press linings in jackets. Sometimes, with that large mass of people, even with our inspections, something will get by that isn't exactly right. One of those men can press with ease 30-odd trousers an hour, or what we characterize as 15 suits an hour.

You go in to a good tailor and he will tell you that it took him three-quarters of an hour to press your suit. We press 12 suits in the same time. Basically the job is almost as good. Perhaps he takes a little more pains. The only analogy I can give you is having a pair of shoes made to order by hand and one made by machine. Of course, the one made by hand may be a little better fitted to your foot, but, substantially, the one that is production manufactured gives you the same utility value. There is very little difference in the basic process between the so-called dollar cleaner and the so-called cheap cleaner, and anyone within the industry will honestly tell you that that is true.

Mr. Benzinger: I have had the privilege of visiting some of your plants, and I must say that you have been very co-operative. The thing that we are mostly interested in is what has caused you the most trouble as far as shrinkage is concerned.

Mr. Paul: In other words, if I understand you correctly, to what do we attribute our greatest cause of shrinkage, shall we say, in silk fabrics?

Mr. Benzinger: Say rayon.

Mr. Paul: Rayon fabrics. Frankly speaking, your shrinkage can come from one of two reasons. We have had any number of garments that have come back to us for stretching that never were wet-cleaned. The ordinary process of physical agitation in these dry cleaning machines, and the drying or deodorizing, where we use steam, caused contraction. I can point out the type of fabric to you when you get to our plant—they have technical names—but I would say the character of construction contributes most to the cause of shrinkage.

In all fairness to you who are on the producing end, it is true that with most of those garments, a yanking, a pulling of the fabric with steam going through it, would enable you to restore it to its normal size, and perhaps if we were the so-called dollar cleaner who wanted to measure the length of the sleeves, the length of the back, the skirt, the hipline, and what not, we would be able to solve those problems and run into comparatively few of them. However, I don't think that five per cent of the cleaners, irrespective of what they charge, truly measure the garment before they give it to you. This is the reason for it: We get back 100 garments because of shrinkage over the period of a given time. Fully 20 per cent of those never did truly shrink. Mrs. Jones takes her lovely pastel and puts it away in the closet, and there it rests until the threshold of the next spring. Then she takes it out and she wants to freshen it up, and in it goes to the cleaner. It is returned to Mrs. Jones. She puts the dress on and it is too tight. Immediately the clamor is that we have shrunk the dress. Mrs. Jones put on ten pounds in the nine months. (Laughter)

In addition to that, we too sometimes are at fault. That is a concession, folks. (Laughter)

In wet cleaning, there, too, we get back to the old coveted methods of the so-called high-priced cleaners, methods of years ago. It is basic that no garment is ever wet cleaned until it is first dry cleaned, with the possible exception of rubberized garments. The high price cleaner always had the idea that if he individually gave each garment his personal attention he would have no difficulty. He would take the garment, stretch it out on a board, take a scrubbing brush—a real good tough scrubbing brush—get some lukewarm water, and proceed to brush the garment from stem to stern. Sometimes he caused shrinkage, sometimes he caused strechning.

We have found from practical experience that the less we do of that the better off we are. We use lukewarm water to keep out the element of heat, because heat, with agitation, will cause shrinkage not only in wools but frequently in your synthetic fabrics. We also have high water levels. You can understand that if you took a lot of dresses and placed them in a cylinder that had a low water level you would have a great deal more mechanical action, but if you made the water level higher, the garments would have a tendency to float rather than to sharply rub one another.

However, by using caution and care in the wet cleaning we have been able to reduce our experience with shrinkage to what I feel is a nominal level. I think

Mr. Marks, who made a great number of test checks both in specific batches and an over-all check, found that in one week, where we handled from 45,000 to 50,000 dresses, we had about 200 come back for stretching. There was no breakdown as to which were wet cleaned and which had only been dry cleaned, but you can see that the number involved was less than one-half of one per cent of the total handled. Even if we had measured every single one we nevertheless would have had some of them returned. The question was whether or not the effort was worth it, and whether or not in the long run you would or would not have had to handle nearly the same number of returns to obtain the proper result.

Mr. Marks: Here is a package containing a suit on which somebody wants an opinion.

Mr. Paul: I didn't bring my tools with me. I haven't those 50 bottles, or 30 bottles I was talking about.

Chairman Tisdale: Exhibit of a brown gabardine suit. Would Mr. Paul kindly give us some reason why this suit should change color in dry cleaning?

Mr. Paul: Looking at these trousers in the dim light, there seems to be a variation of color between the jacket and the trousers. At close hand, the trousers seem to be reddish and the jacket seems to be brown. We do a little more detective work. We look at the label, and it has the name of a manufacturer in Houston, Texas. We all know that gabardines are summer garments. We know that this fellow bought it in Texas and most likely wore it there.

We not only know that, but we know that he is a member of your good Association. I have yet to see a good chemist who doesn't take off his jacket, roll up his sleeves, and go around the laboratory and do a lot of work. The jacket was well protected. The trousers —he never took them off, not down at the laboratory. (Laughter) The result was that his trousers received two or three times the amount of wear—this is all supposition; it may not be true but I give you my offhand opinion—that the jacket did.

If he worked in the South, and he worked in hot weather, there must have been a great deal of perspiration on the trousers, and I note that it is not on the jacket. Looking under the armpits, there is no manifestation of substantial perspiration. Nevertheless, that doesn't say that the fellow didn't do a great deal of sweating in his trousers while working around the laboratory, or wherever he may have been working. Possibly he may have spilled some chemical on the trousers that didn't come out in that normal cleaning about which we were talking. He may have spilled so much of it that when the spotter came to it, looked at it and saw the number of stains, he immediately said, "Wash it." Or, if it was perspiration, (which I really think was the basic cause), the perspiration would settle primarily in the knees and down toward the ankles. The only way that we can truly get perspiration out is to wet clean the trousers.

Looking at the trousers it is hard to notice, but it seems to me as though they are more discolored down toward the bottom of the garment. I would say that what actually happened was that the trousers were given to a better dry cleaner (laughter), and instead of taking them and throwing them into a regular wheel so the whole trouser was immersed, this gentleman laid the trousers out on a board and scrubbed them from this part down. Unfortunately the color was not fast enough to withstand some of the alkali that was used in the soap solution, causing a lightening of color.

That is just an offhand opinion.

Chairman Tisdale: Here are some additional questions. This question is on a cotton fabric given a regular Zelan finish. How much of the finish is removed by dry cleaning?

Mr. Paul: I profess ignorance as to what a Zelan finish is. If you will tell me what that is basically, I will tell you approximately what is removed. Will the man or the lady who put the question tell me?

Mr. Marks: That is a permanent water repellent.

Mr. Paul: It all depends on what the base is. Of course, there have been all types of water repellent finishes that have been used, ranging from the use of aluminum stearate down to a solution of rubber cement, queer as it seems. Of course, if it has any rubber cement in its constitution that is going to be entirely removed, because it is soluble in petroleum solvents.

Without knowing anything further about it, that is all I can say. It depends entirely on what the solvent reaction is to the finish, or what possible water reaction may be to it. Of course, being water repellent, I don't imagine that water would do much of a job.

I will say this with regard to our experience with one of the oldest and best known water repellent cloths, and there, as with most water repellents, after use in time it disappears. Naturally, the physical action, the friction, the rubbing, the chafing that garment must go through in dry cleaning, even though it does not remove the finish by nature of the chemical ingredients, nevertheless would have a tendency to remove some of it.

Chairman Tisdale: There is another question here which I think you have partially answered. To what extent is cleaning with soap and water carried on in the dry cleaning industry? I think you have already touched upon that.

Mr. Paul: Normally, on dresses and suits that runs to about 10 per cent. I should say at this time that in the various seasons of the year the amount of wet cleaning runs in, I might say, different proportions. The percentage of wet cleaning of white garments runs very high. Even in our plant we wet clean as many

as 30 or 40 per cent, and that is basically because of the bleaching which may be required to restore the whiteness of the fabric.

Chairman Tisdale: How do you care for the shrinkage of certain types of women's wear wool fabrics if you clean them dry or with soap and water?

Mr. Paul: In dry cleaning there are certain basic attributes. That is, generally speaking the process makes no change in the character of wool fibers, and the physical dry cleaning process will not cause shrinkage. Sometimes the use of too much steam in the drying process, or too much steam with certain fabrics in pressing will cause shrinkage, but no particular pains are taken to prevent that, because such instances are slight. In the instance of wet cleaning, of course the problem becomes much more acute. Our first and basic safeguard against material shrinkage is using lukewarm water. The second thing is to place these wool garments in rotating cylinders and give them as short a run as is consistent with good cleaning of the garment. I think our total wet cleaning run may be eight or nine minutes in sum total as against a normal run of an hour, as is usually employed on cotton fabrics in laundries.

After the garments have been wet cleaned, they are placed upon what is known as a wind whip. In effect, all it is is that the garment is placed on a hanger and tacked down to a fan at the bottom. The huge fan sends a draught of warm air through the garment so that it expands the garment and stretches it back as near possible to its original size.

In addition to that, all wet cleaned woolen fabrics are given to a small group of operators in their pressing, and they are under instructions to stretch them as much as possible, because it is rare that they will ever stretch the garments more than their original size.

Those are the normal safeguards, and with all of it, I think our greatest difficulty in shrinkage does not come basically from the rayon fabrics but comes primarily from the wet cleaned wool fabrics. One of the greatest headaches, by way of illustration, is the bathrobe that you use at home. You spill everything on it, and then when it finally is crusted so you can't see its original color, you send it in to the cleaner (laughter), and how you do cry when it comes back slightly shrunk. Many of those so-called French flannels will shrink tremendously. Many of them are returned to the customer with a note to the effect that we will not wet clean it until the customer is advised of the hazard and is willing to assume it.

Chairman Tisdale: This is the last question handed to me: "Some garments have been returned to us which have not been washed but apparently have been dry cleaned only, but show a decided change in the shade of the garment in certain of its parts. We have only been able to duplicate this color change by treatment with strong hydrochloric acid solution and wet hot pressing. Can you explain how such a color change can be produced in dry cleaning, and also why?" (Laughter)

Mr. Paul: Of course, that is a rather difficult question to answer without seeing the garment itself, but some of those peculiar fabrics which you men have been designing in recent years may account for it. We kick the football around, as you see, to your side of the fence. However, I have seen ordinary handirons that are used to touch up dresses, frequently those that have a taffeta finish. Even an iron that is slightly hot will cause the fabric to change into all kinds of peculiar hues. When the hand presser notices that, she may or may not stop her work. If she stops, and your wife happens to be the fortunate one, she will find parts of the garment one hue and other parts another hue. Unless there is contact with immediate heat, I don't think you will find those variations of color.

However you may run into the experience we had about three years ago with a woman who sued us. This woman went to a store and bought some cloth, from which she made a very beautiful white coat. When we returned it to her she complained that parts of the coat were one color and parts were another. The bindings on the pockets were one color, and the facings were another. While the shades were both white, they were two shades of white, distinctly obvious if you were to look at the garment.

Of course, you can readily understand, from the process that we use, that the garment was processed identically along with hundreds of others. How was it possible for the binding, which clearly ran into the rest of the garment, to be one shade, and for that peculiar shade to end exactly where that piece of cloth ended, and then the other hue commence where the attaching piece began? Of course, the answer was quite simple. The store sold her two pieces of goods from two different bolts, finished at two different times.

Of course, we went into court and the woman claimed she had bought all the cloth of the coat at the same time. Because of our plea, the Justice of the Peace put the case over and asked the woman to get a representative of the store to come up and testify. When he did come up, he had a record of the sale. She first bought one piece of goods, found she didn't have enough, returned to the store, and thought she was buying the identical piece of goods. It was identical, but it was part of another bolt, which apparently had gone through the processing or finishing at a different time.

With whites and blacks, as you well know, the difference is readily discerned. Of course, that is going a bit afield, but without seeing the garment I frankly say that all I can think of at the moment is that rayon taffeta which changes hue with the touch of a hot iron may explain the problem.

Mr. Knowland: An Army blanket which soldiers have been using, naturally is going to acquire a great deal of perspiration. I would like to ask this question in two

ways: (1) How would that be dry cleaned or wet cleaned? (2) Would it be handled differently if it had been mothproofed?

Mr. Paul: I am glad you asked that question, because it may seem to be an academic question on the surface, but it is a very, very practical one at the present time. We have bid on any number of contracts with the United States Army for what they call their comforter, and I think you have that in mind. That is the thing that they sleep on. It is an article that is made of cotton cloth filled with kapok or cotton filling. The Army requirements are that they be shampooed, be wet cleaned, and who are we to question that, because they have unquestionably determined what process they want after considerable research.

However, we believe that normal dry cleaning is much to be preferred over shampoo. Take this heavy, massive comforter, which perhaps on first impression looks like it is an inch or an inch and a half thick, filled with this fluffy cotton. You put it through wet cleaning, which means water and soap. It is almost impossible to rinse the kapok sufficiently to remove all of the soap. A good deal of the soap that may be used may contain a certain element of animal fat which in time may turn rancid. The kapok mats with the use of water.

We found that the comforter looked as bad as though it had gone through a mangle. We decided to try normal ordinary dry cleaning. The perspiration and the body oils—were much more definitely and much more effectively removed with the use of the solvent, together with a certain element of moisture. The fluffiness of the kapok was not removed by dry cleaning. In the last few weeks we have had occasion to handle several thousand of them, and after processing them and returning them to the respective quarters we didn't hear a single complaint. One of the supervising officers complimented us on the character of the work.

That has been our own experience in the handling of those comforters.

Mr. Knowland: In connection with a lady's dress, whether it is a solid shade with white piping, or picot edges, or whether it is 50 per cent a print, or whether it is 25 per cent white, during the wearing of that dress and aging, the white is naturally going to turn grey. Do you make any attempt to clear those whites?

Mr. Paul: We make no attempt to clear those whites in normal dry cleaning, but if the hue has turned badly, we will take it through the wet cleaning and use a small percentage of sodium perborate as a bleach. We have found that if the percentage is small enough, on those garments that have white trim the tendency will be to whiten the white without affecting the other colors.

Mr. Knowland: In dry cleaning any woolen fabric that is marked "mothproofed" do you handle it differently?

Mr. Paul: You see, mothproofing, at least on the dry cleaning end of it, hasn't advanced to the stage that possibly water repellency has. The basic mothproofing on original fabrics and articles that are sold to the consumer —such as new blankets advertised as mothproofed—as I understand, has been introduced by a wet cleaning process. Since then there have been other methods where they have used dry cleaning processes.

With regard to an article brought to us which has been mothproofed, if the vehicle of mothproofing has been dry cleaning, in other words, if it has originally been put in by a dry solvent, our dry cleaning will remove it. If it has been put in with a wet solvent, water, the normal dry cleaning process will not remove it, but will definitely reduce its efficiency.

Miss Falcone: Do you anticipate a shortage in the dry cleaning service during the war?

Mr. Paul: I had occasion to go to Washington about two weeks ago, when the gentlemen that the War Production Board placed in charge of the cleaning and laundry industry called a conference. They told us of all the things we wouldn't get. We weren't going to get wire hangers any more, and we aren't. So you can expect in the very near future your garments to be given to you across the front counter across your arm. They told us we would have difficulty getting paper, that we would have difficulty getting bleaches, particularly those derived from chlorine. We would have difficulty in getting many other chemicals. We would have difficulty in time in getting tags. Tags are made of cotton cloth and zinc. The little prongs are made of zinc, so that when the tag goes through the wet cleaning process it won't rust. I don't have to tell you about zinc. It is way up on the priority list.

A gentleman in charge of one particular department in Washington happens to be a very kindly college professor, and the way he put it was, "You don't have to use cardboard on shirts, and if you don't have starch, we will have soft shirts. If we have to wear the shirt a day or two more, what difference does it make?" With that philosophy in Washington, you are going to be short a number of things. (Laughter)

I say to you that they may take away the hangers and they may allocate the solvent and do a thousand and one other things, but we will still offer the service. I might however say this: In England, where the problem has become acute, they have shut down a great number of plants and concentrated the work into a comparatively small number, limiting the number of garments that can be dry cleaned and almost placing it on a ration basis for the producer. The theory was that by so doing they would limit the use of the chemicals and other requirements, so that there might be reasonable distribution of those same items for other industries.

Mr. Schmidt: When the garments are dry cleaned, are they sterile?

Mr. Paul: We maintain that dry cleaning will sterilize your garment. Truthfully, the dry cleaning process does not do it, but in the deodorizing process, for a short period, when the garments are almost completely dried, we shoot live steam on the fabric. The object of that is not sterilization, but so that the moisture in the live steam will bring to the surface those hidden spots, change the color of many spots that blend into the fabric, so that when the spotter gets the garment he can remove the spot.

However, that very action serves to sterilize just like those sterilizing chests that you see in barber shops. So I can truthfully say we do sterilize the garment.

Mr. Schmidt: Are the garments examined to see that they are sterile, or do you just assume that they are sterile?

Mr. Paul: I am assuming that they are.

Mr. Brosnan: In wet cleaning, does it always include a detergent, some sort of a soap action? When you say wet cleaning do you automatically mean soap?

Mr. Paul: Yes, we do.

Mr. Brosnan: I was wondering if it was just steam in the one case, and if, when it was really bad, you included soap.

Mr. Paul: No. Let me say this in passing: that a typical illustration of wet cleaning is to take 75 or 100 dresses of like kind or like color, which have been selected to determine that they won't run in ordinary water treatment. They are placed in this cylinder. The water level, as I spoke of before, is placed high, lukewarm. They are run for about two or three minutes, and then into that movement is introduced about three-quarters of a pound of neutral soap. That is then run in that fashion only four or five minutes. Sometimes after that, if the garments have been selected for their white trimmings, we will introduce sodium perborate. We will run that for four or five minutes, then drain off the water and put it through two or three successive rinses, so that there is definitelv a detergent action. We don't have to have the number of runs that an ordinary laundry does, because, remember, the only garments we ever wet clean are those which have already been dry cleaned, so that there is no surface soil. It is merely to get out those stains that water alone will remove.

Mr. Brosman: I am thinking of color now rather than fiber. If the color would stand, say, soaping at 120 degrees Fahrenheit, it should stand anything that a dry cleaner would give it.

Mr. Paul: Definitely, because the temperature of our water runs between 80 and 90 degrees.

Mr. Carman: I understand that at the close of dry cleaning you add a finish. I just wonder if you would say something about that.

Mr. Paul: Yes, I would be very happy to. You know most fabrics today have some sort of a finish. I am talking particularly about the different silks and rayons. With regard to men's garments, while they may not have a finish, most woolen manufacturers use in part some shoddy, which, of course, is your short hair. The physical agitation in these large cylinders, particularly where they have been more and more coming into universal use—that drop that I talked about, when we had our fingers crossed —has increased the mechanical action, the chafing, the rubbing, and what-not, which has a tendency to in part take out some of that shoddy or short hair on woolens and to remove the finish or size that may be used on other fabrics.

Some time ago we came to the conclusion that we ought to do something about restoring some of that body, to give the wools and rayons more body and a better draping quality. In trying to find something, we turned to the work that had been done in connection with necktie fabrics. We found that the waxes were the right family to go to. We experimented and finally wound up by using a combination of carnauba, ceresine and paraffin waxes. The result is that after we have completely dry cleaned a garment today, when we normally would take it out and put it into the centrifuge for extraction, we put it through one additional process which takes about three to four minutes.

We have a huge kettle alongside of our dry cleaning machines, where we melt down these waxes. We take a bucketful of a certain proportion and put it into the machine and continue to rotate these garments. Through capillary attraction the garments absorb these waxes. We have found from experience that we have been able to gain that body in the garment itself.

We have also found, we believe—and our tests have shown that we are right—that on men's garments it maintains the press longer. In other words, instead of having to press the garment after you have worn it a couple of times, it will last for another time or two. So that we advertise this finish which we call our "Lustrotone Finish," and get two pennies more a dress and three pennies more a suit for this additional service. We only use that process where it is wanted. I might add at this time that our experience shows that 90-odd per cent of the people coming into the store desire this added feature.

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Report of Sectional Committee on FASTNESS OF COLORED TEXTILES ASA Project L14

SECTIONAL Committee L14 on Fastness of Colored Textiles was organized in April, 1941, under the procedure of the American Standards Association with the American Association of Textile Chemists and Colorists and the American Society for Testing Materials as co-sponsors. The scope of the committee is as follows:

Scope—Correlation of standards covering test methods for the fastness of colored textiles to color-destroying agencies and the evaluation and interpretation of data obtained

from such tests—the work to be based upon standards developed by co-operating organizations.

The personnel of the committee was approved by the ASA on May 21, 1942, and includes representatives from the following organizations:

American Association of Textile Chemists and Colorists,
American Association of Textile Technologists,
American Association of University Women,
American Council of Commercial Laboratories,
American Home Economics Assn.,
American Institute of Laundering,
American Society for Testing Materials,
Cotton-Textile Institute,
Limited Price Variety Stores Assn.,
Mail Order Group,
National Assn. of Dyers and Cleaners,
National Assn. of Finishers of Textile Fabrics,
National Assn. of Wool Manufacturers,
National Bureau of Standards,
National Federation of Textiles, Inc.,
National Retail Dry Goods Assn.,
Synthetic Organic Chemical Manufacturers Assn.,
Textile Fabrics Assn.,
U. S. Department of Agriculture, and
Office of Price Administration (*liaison*).

Meetings of the committee were held in New York, N. Y., on July 9, 1941, February 17, 1942, and on March 14, 1942. Several meetings of each of the two sub-committees have been held.

The sub-committee interested in the correlation of standard test methods has prepared for consideration as an American standard a Method of Test for Colorfastness to Commercial Laundering and to Domestic Washing of Cotton and Linen Textiles. This work was done under the chairmanship of W. D. Appel and is a correlation of the test methods described in the A.A.T.C.C. Year Book,[1] in A.S.T.M. Standard Method D 435-41[2], and in the Commercial Standard for Woven Textile Fabrics, Testing and Reporting (CS59-41). Similar efforts at correlation are being made for the other test methods for determining the color-fastness of fabrics.

The sub-committee on terminology to describe fastness of colored fabrics to color-destroying agencies was expedited by a request, dated February 7, 1942, from the Office of Price Administration, to develop a system of terminology to assist the Federal Trade Commission. Recommendations made by this sub-committee were acted upon by Sectional Committee L14 at its meetings in February and March and were then transmitted to the O.P.A. and the F.T.C. on April 7, 1942. These recommendations have not yet been submitted to letter ballot of the sectional committee inasmuch as they were intended to be of assistance to the F.T.C. at its hearing in New York on April 10, 1942, and the final terminology adopted by the Commission would be the basis for the final American standard for the description of color fastness of colored fabrics.

Respectfully submitted on behalf of the sectional committee,

JULES LABARTHE, JR., *Chairman.*
B. A. RYBERG, *Secretary.*

[1]Fastness Tests for Dyed or Printed Cotton, 1941 Year Book, Am. Assn. Textile Chemists and Colorists, Vol. XVIII, p. 186.
[2]Standard Method of Test for Fastness of Dyed or Printed Cotton Textiles to Laundering or Domestic Washing (D 435-41), 1941 Supplement to Book of A.S.T.M. Standards, Part III, p. 163.

PROPOSED AMERICAN STANDARD
ASA Project L 14
Standard Method of Test for Fastness of Colored Textiles to Normal Perspiration
A.A.T.C.C. Official Method
A.S.T.M. Designation: ?

Scope

1. This method of test covers the procedure for determining the colorfastness to *normal* perspiration of all colored textiles, whether dyed, printed or otherwise colored.

2. Apparatus

Test tubes or vials 15mm x 75 mm for light fabrics.
22mm x 120mm for heavy fabrics.
Test tube rack.
Drying oven maintained at 100° F. ±2°.

Reagents and Materials Required

3. Two solutions are required as follows:

Acid solution	Alkaline solution
10 g sodium chloride	10 g sodium chloride
1 g lactic acid, USP 85%	4 g ammonium carbonate, USP
1 g disodium orthophosphate anhydrous	1 g disodium orthophosphate anhydrous
Make up to 1 liter with distilled water.	Make up to 1 liter with distilled water.

Composite test cloth[1]

Test Specimens

4. One specimen shall be used for each of the types of test to be applied (four types are described in Section 5) and one specimen shall be reserved for comparison with the tested specimens.

Each specimen of the fabric shall be about 2 inches wide and of sufficient length that when rolled lengthwise together with a similar sized piece of the composite test cloth and inserted in the glass tube, the roll will fit the bore of the tube reasonably tight.

Types of Test

5. Four tests are described which differ only in the time of exposure in the oven as shown in Table I.

Procedure

6. One of the test specimens and a similar size piece of the composite test cloth are thoroughly wet with the acid solution. The amount of solution left in the specimens

[1]Consists of a lightweight worsted fabric containing wool, cotton, silk, viscose rayon and acetate rayon yarns in the form of floats on one side of the fabric. This type of cloth is obtainable from the American Woolen Co., Andover, Mass. (Style DD-8370).

TABLE I

Test	Types of Test Temp. Deg. Fahr.	Time
No. 1	100	40 minutes
No. 2	100	2 hours
No. 3	100	6 hours
No. 4	100	18 hours

should be in such a ratio that when the roll weighs dry 2½ g, the total weight will be 8 g. The two pieces are then rolled together with the fabric to be tested on the inside. The other test specimen is prepared in a similar manner, except that the pieces are wet thoroughly with the alkaline solution.

Each roll is then inserted in the glass tube, one end of which is closed, leaving one-third of each roll projecting, the other two-thirds of the roll being protected from evaporation.

The tubes shall be placed in an oven maintained at a temperature of 100°±2°F. and should stand on end preferably in a rack. The specimens shall be allowed to remain in the oven for the necessary length of time and upon removal shall be dried without rinsing.

Unsatisfactory perspiration fastness may be due to bleeding or migration of color or it may be due to change in shade of the dyed material. It should be noted that objectional change in shade may be encountered with no apparent bleeding. On the other hand, there may be bleeding with no apparent change in shade or there may be both bleeding and change in shade.

Classification for Colorfastness

7. The specimens shall be assigned to the highest classification for which they qualify under the following scheme, and shall be so reported.

Class 1.—Fabrics which show an appreciable staining of the test cloth equivalent to Munsell Neutral Value Scale No. 8 or greater and an appreciable migration and change in shade in Test No. 1, shall be reported as having "Class 1 colorfastness to normal perspiration."

Class 2—Fabrics which show an appreciable staining of the test cloth equivalent to Munsell Neutral Value Scale No. 8 and no appreciable migration or change in shade in Test No. 2 shall be reported as having "Class 2 colorfastness to normal perspiration."

Class 3—Fabrics which show an appreciable staining of the test cloth equivalent to Munsell Neutral Value Scale No. 8 and no appreciable migration or change in shade in Test No. 3, shall be reported as having "Class 3 colorfastness to normal perspiration.

Class 4—Fabrics which show *no* staining of the test cloth and no migration or change in shade in Test No. 4, shall be reported as having "Class 4 colorfastness to normal perspiration."

Fabrics (Colored) which fall into Class 1 may be considered as possessing little or no fastness to normal perspiration and shall be classified as "Poor."

Fabrics (Colored) which fall into Class 2 may be considered as possessing some fastness to normal perspiration and shall be classified as "Fair."

Fabrics (Colored) which fall into Class 3 may be considered as possessing good fastness to normal perspiration and shall be classified as "Good."

Fabrics (Colored) which fall into Class 4 may be considered as possessing the highest degree of fastness to normal perspiration and shall be classified as "Fast."

TENTATIVE SPECIFICATION FOR STANDARD ILLUMINANTS IN TEXTILE COLOR MATCHING
(Revised June 26, 1942)

Scope 1. This specification applies to artificial illuminants which are capable of furnishing standardized light sources for judging the color of textiles.

Section of Illuminants. 2. It is recognized that the colors of textiles in ordinary use may be observed in daylight under widely different conditions. Daylight color ranges from the reddish color of horizon sunlight at a color temperature of about 2,300°K through noon sunlight at about 4,800°K, to average daylight at 6,700°K to 7,500°K, and from there to blue sky which may range in color temperature anywhere from 10,000°K to 25,000°K or higher. If textile colors match under lamps representing two widely different phases of daylight then it may be assumed that they will usually be a match under other daylight conditions. Two types of artificial illumination are therefore considered sufficient to satisfy the purposes of this specification: One illuminant to be representative of the lower range of color temperature, and the other to be representative of a range that represents preferred conditions for daylight inspection.

Specification of illuminants. 3. The artificial light units shall be capable of supplying diffused illumination uniformly over an area large enough so that the textile specimens whose colors are to be matched or graded may be moved about freely. The angular field subtended by the source of light at the sample shall not be small. The illumination on the working plane shall be 60 to 80 footcandles for grading of white and light materials (daylight reflectance greater than 40 per cent, or samples lighter than Munsell 7/); the illumination shall exceed 100 footcandles for materials of intermediate lightness (daylight reflectance between 6 and 40 per cent, or samples between Munsell 3/ and 7/), and the illumination shall exceed 150 footcandles for dark materials (daylight reflectance less than 6 per cent, or samples darker than Munsell 3).

4. One illuminant shall be in general comparable to I.C.I. (International Commission on Illumination) Illuminant A, which is a tungsten lamp operated at 2,848°K. But since horizon sunlight at 2,300°K is also in the low range of color temperature yet is enough redder so that it is preferred by many for textile color matching, the toler-

ance allowed for the illuminant to represent the low range of color temperature is 2,300°K to 2,900°K in order to provide a wide latitude that will include the use of either. For check comparisons between laboratories the tolerance shall be limited to ± 25°K.

5. One illuminant shall be in general comparable to I.C.I. Illuminant C, a tungsten lamp operated at 2,848°K with a specially prepared liquid filter that raises the color temperature to about 6,700°K, and gives a color which approximates that of average daylight. But since this standard is lower in color temperature than is preferred in most daylight inspection work, and since there is very general agreement that 7,500°K comes nearer to the preferred illuminant (moderately overcast sky from the north), the tolerance allowed for this illuminant is 6,500°K to 7,500°K. For check comparisons between laboratories, the tolerance shall be limited to ± 100°K. This specification can be satisfied by a tungsten filament lamp of suitable wattage, plus a glass filter equal to or better than Corning No. 590, the filter to be of a thickness that will give the required color temperature. The energy curve of the illuminant, if it differs from I.C.I. Illuminant C must be reasonably similar to it, and in order to satisfy this requirement the ratio of spectral transmission of the filter at wavelength 670 mμ to that of 700 mμ shall be 0.9 or more.

Specifications for wall colors and for background illumination are important to this problem, and should also be included in any complete specification.

APPLICANTS FOR MEMBERSHIP

Active

Grinnell Jones—Professor of Chemistry, Harvard University, Cambridge, Mass. Sponsors: H. C. Chapin, Frank Rizzo.

William Randolph Larson—Textile Chemist, E. I. du Pont de Nemours & Co., Wilmington, Del. Sponsors: C. A. Seibert, C. A. Sylvester.

John B. Mungall—Asst. Overseer of Dyeing, Avondale Mills, Sylacauga, Ala. Sponsors: M. T. Barnhill, H. M. Comer.

James H. Murray—Chemist, Providence Dyeing, Bleaching and Calendering Co., Providence, R. I. Sponsors: S. N. Freeman, R. W. Ward.

Walter E. Murray—Sales Manager, Warwick Chemical Co., West Warwick, R. I. Sponsors: R. A. Pingree, G. E. Prime.

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Henry Sandler—Asst. Dyer, Raynit Mills, West New York, N. J. Sponsors: W. Gutig, V. Froelicher.

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Dan B. Wicker—Supt., Fibro Pilot Plant, American Viscose Corp., Nitro, West Va. Sponsors: L. S. Converse, F. Bonnett.

Joseph A. Woodhead—Supervisor, Tech. Service Div., Colgate Palmolive Peet Co., Jersey City, N. J. Sponsors: C. A. Seibert, E. F. Monroe.

Junior

Raymond F. Hooper—Lab. Asst., Pacific Mills, Worsted Div., Lawrence, Mass. Sponsors: J. N. Dalton, H. T. Rooney.

Jack Jordan—Lab. Asst., Wiscassett Mills Co., Yarn Dyeing Dept., Albemarle, N. C. Sponsors: T. R. Smith, C. H. Morris.

Walter Juda—Asst. to Professor Grinnell Jones, Chemistry Dept., Harvard University, Cambridge, Mass. Sponsors: H. C. Chapin, F. J. Rizzo.

Herbert Walter Levi—Research Dept., Sidney Blumenthal Co., Shelton, Conn. Sponsors: J. A. Woodruff, H. H. Taylor.

Raymond George Massingham—Laboratory, Delta Finish Co., Philadelphia, Pa. Sponsors: R. M. Ritter, J. P. Conaway.

Associate

Joseph E. Buonanno—President, Atlantic Chemical Co., East Providence, R. I.

Frederick J. Cramer — Operator, Trogan Powder Co., Sandusky, Ohio.

Edward H. Endelson—Manager and Colorist, Textile Printing Co. of Warren, West Warren, Mass.

Edward E. Greene—Stock Clerk and Pressman, Ansbacher Siegle Corp., Brooklyn, N. Y.

Joseph N. Paradis—Editor, "Fibre & Fabric," Cambridge, Mass.

Frank E. Reardon—President, Service Paper Co., Pawtucket, R. I.

Glendon E. Robertson—President, The Roxborough Co., Philadelphia, Pa. Sponsor: W. A. Stringfellow.

Student

John A. Arey, Jr.—North Carolina State College. Sponsor: A. H. Grimshaw.

Dan Moss—North Carolina State College. Sponsor: A. H. Grimshaw.

Charles K. Watson—North Carolina State College. Sponsor: A. H. Grimshaw.

Nai-zer Yao—North Carolina State College. Sponsor: A. H. Grimshaw.

Harold R. Houghton — New Bedford Textile School. Sponsor: F. Tripp.

Ruth M. Howorth—E. H. Richards Inst., Penna. State College. Sponsor: P. B. Mack.

James V. Perkins — Bradford Durfee Textile School. Sponsor: L. B. Coombs.

Louis Mario Vavala—Bradford Durfee Textile School. Sponsor: L. B. Coombs.

Applications for transfer to Senior membership—S. M. Cone, N. E. Daher, L. Gleklen, H. A. Green, H. H. Hatch, R. L. Jones, A. E. Koch, H. Liebmann.

TRADE NOTES • NEW PRODUCTS

• PRIORITIES CHANGES

A brief review of three sweeping changes being made in the priorities system after July 1st was sent recently by the Priorities Department, Region 2, War Production Board, to chambers of commerce and trade associations throughout New York and Northern New Jersey.

Discussed were the Production Requirements Plan, the Allocation Classification Systems, and the uniform procedure for applying and extending all preference ratings.

The business groups were urged to see that their members received copies of the review which bore the heading "After July First: Important Priorities Changes." Copies may be obtained in New York from the Priorities Department, 122 East 42nd Street, New York City.

• JOINS DEFENSE SUPPLIES

Oliver H. Clapp has resigned as an Assistant Vice-President of Stein, Hall & Co., Inc., 285 Madison Avenue, New York, manufacturers and distributors of starches, gums and dextrines, and importers of burlap, to become associated with the Defense Supplies Corporation, Washington. Mr. Clapp has been in charge of the Burlap Division of Stein-Hall's Foreign Department since last December, when Morris S. Rosenthal, a Vice-President of the company, went to Washington to become Assistant Director of the Board of Economic Warfare. Mr. Clapp assumed his new duties on July 6.

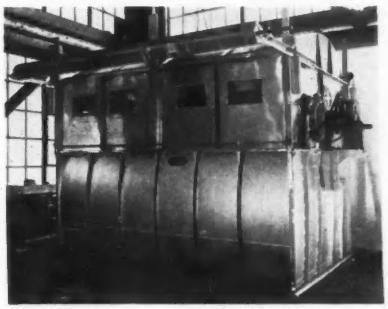
The management and supervision of Stein-Hall's Burlap Division are now integrated in the Foreign Department under Cecil M. Coryat and Robert M. Stein, Assistant Vice-Presidents, who have headed that department for some time.

Mr. Clapp has spent nearly all of his business life in the burlap trade and has been associated with Stein-Hall for many years. He was formerly in the New York office of Mente & Co., Inc., of New Orleans. He is a member of the Board of Governors of the Burlap and Jute Association and has spent much time in Washington in recent months in behalf of the association and the industry.

In announcing Mr. Clapp's withdrawal from the company to enter the Government service, Frank G. Hall, President of Stein, Hall & Co., Inc., said:

"We very much regret losing, for the duration of the war, the services of such a highly valued associate. We do, however, take pride in the knowledge that the Government has recognized his character and ability, and we are happy indeed to make this contribution to the common cause. Industry and individuals alike must obey when our country calls."

LARGE DYEING MACHINE



The Rodney Hunt Machine Company of Orange, Mass., has recently shipped an unusually large Tru-Shade stainless steel dyeing machine to the Signal Knitting Mills in Chattanooga, Tenn. This machine, which is of the all-enclosed type, is equipped for washing, dyeing and bleaching knitted fabrics, and is believed to be one of the largest such units now in operation in the world for this type of work. Note the curved sides, an unusual construction feature of Tru-Shade machines, which the manufacturer claims gives added strength to the tub when filled with dye liquor.

• NATIONAL CARBON BULLETIN

National Carbon Co., Inc., Carbon Sales Division, Cleveland, Ohio, has recently issued a bulletin giving up-to-date information on "National" and "Karbate" carbon and graphite corrosion resistant pipe, tubes and fittings. The bulletin gives descriptions and properties of these products, shows resistance to chemical action, gives information on heat exchangers, illustrates types of joints, lists dimensions of fittings and valves and shows typical installations. Copies are available upon request.

• RUST EETER NO. 66

The Harrington Paint Co., Inc., 1630 Collamer Avenue, East Cleveland, Ohio, is offering a paint for use in dyehouses and bleacheries which is said to withstand the action of formic and acetic acid (both glacial and dilute). It is further said to be practically chemically inert and to dry within less than an hour. The paint is waterproof. It is known as "Rust Eeter No. 66" and samples are available.

• WPB CLASSIFICATIONS

For the convenience of chemical buyers, Westvaco Chlorine Products Corporation has issued, on a handy letter-size card, a summary of WPB Allocation Classification Order Numbers.

On the face side is a summary of the instructions issued by WPB on the Allocation Order Number system to be used on all purchase orders dated June 30, 1942, and thereafter. On the reverse side is a tabulation of the order numbers and classifications covering every branch of military and civilian goods.

Copies of this desk-card may be obtained without charge from Westvaco Chlorine Products Corporation, 405 Lexington Avenue, New York, N. Y.

• CALCO BULLETIN

Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J., has available a number of reprints of the paper "Microscopical Observations of Union Dyeing," which appeared in the AMERICAN DYESTUFF REPORTER on June 8th, 1942. It is issued as Calco Technical Bulletin No. 654.

Calco has also issued a new bulletin containing formulae for dyeing the "United Victory Shades" selected by the Textile Color Card Manufacturer's Association. These formulae, developed especially for dyeing of the new mixed fibers which are expected to be so popular in the Fall, are presented in Calco's Technical Bulletin No. 655.

The formulae as presented have been prepared on 11-oz. cotton warp fabrics, the warp accounting for 50 per cent of the weight, while the filling yarn is made up of 80 per cent wool and 20 per cent staple viscose rayon.

As has been the case in the past, Calco makes available these new bulletins, without charge to the trade, on application to the main office at Bound Brook, New Jersey.

• PAYROLL SAVINGS PLAN

Following a broad program to put the power of an organized promotional campaign behind the Payroll Savings Plan, the United States Treasury Department has made available to nearly every business firm in the country a complete set of promotional material.

All this material is designed to help business firms achieve more quickly the goal of at least 10 per cent of Payroll invested in War Savings Bonds.

Nearly 100,000 of the nation's business firms have already installed, and are operating under, this plan which permits systematic purchases of War Bonds by employees through voluntary allotments from each worker's pay envelope. In most cases the management of the company absorbs the entire cost of administration and bookkeeping—and the plan is so simple in its operation that this expense is normally quite modest.

Experience has proved that the Payroll Savings Plan is most effective when stimulated by a well planned, fast-moving program to explain the operations and bene-

fits of the plan and see that it is properly sold to each employee.

Accordingly, the War Savings Staff, with the voluntary assistance of some of the nation's ablest advertising and merchandising men, has prepared and made available complete sets of material that will assist every company in putting on a sustained and successful drive.

The first item in this group of material is a book titled "A Plan for Diverting at Least 10 Per Cent of America's Payroll Into U. S. War Bonds." This book outlines the basis for the overall campaign and explains the general types of material available.

For the benefit of businesses who may not have installed the plan there is another booklet called "How to Install and Successfully Operate a Payroll War Savings Plan for the Regular Purchase of U. S. War Savings Bonds." This booklet explains in simple clear-cut terms how simple and easy it is for any business organization to make the benefits of Payroll Savings available to its workers.

Basic book for the employee is the one "Give 3 . . . Get 4!" In addition to explaining how money saved by workers is of vital importance in winning the war, it drives home the sound practical benefits each worker will gain by having a reserve fund saved up for the post-war years. It also answers questions that may be in the worker's mind as to the value of War Bonds as an investment.

Three small envelope stuffers, to be distributed via the pay envelope, are also included. They are designed to keep the subject fresh in every person's mind; to pre-sell workers so that the "Campaign chairmen" will be able to turn in the highest possible percentage of signed authorizations for payroll allotments from the workers they approach.

To give each worker tangible evidence of his participation in this "All America" program, lapel buttons are furnished reading, "I am buying at least 10 per cent." Window stickers with similar copy are provided for the worker's home.

When the entire business has signed up for a minimum 10 per cent payroll, it is authorized to acquire and display the official Treasury Department Target Flag.

This material is distributed through the offices of the War Savings Staff's State Adminstrators. Any company desiring to get a plan rolling at once is invited to call their local State Administrator's office and request quantities as needed.

Planned promotional programs have proved their value over and over again, in all types and sizes of business organizations. The Treasury Department is harnessing this proved productive method to bring to a speedy conclusion successful Payroll Savings drives in every business throughout the land. Industry, workers and the nation will be benefited as a result.

● AMERICAN VISCOSE LABORATORY

The name of the American Viscose Corporation's Textile Research and Standards Laboratory, located at Marcus Hook, Pa., one of the company's principal research and testing laboratories, has been changed to the Standards Department, it was announced recently. The new name was chosen because it better describes the functions of the laboratory and gives recognition to the continued growth of its activities in connection with standardizing numerous test methods.

Under Dr. F. Bonnet, Director, and L. S. Converse, Assistant Director, the laboratory for many years has been conducting analyses and applied research work on textiles and textile fibers designed to improve manufacturing methods and to increase the assistance that the company can give to its customers in the textile industries. Test methods have been studied and standardized in the laboratory, and in other phases of its work it cooperates with the laboratories at the company's seven plants to make certain that quality standards are rigidly maintained.

● NEW WINDOW PANE

A new type window pane of transparent plastic laminated with wire mesh which will withstand the explosion of a 150-pound bomb eight feet away has been developed for use in military construction and industrial plants in potential air raid zones.

The new material was developed by the Plastics Division of Monsanto Chemical Company in cooperation with the United States Navy to end the menace of flying glass, which experience in England revealed was one of the chief dangers in an air raid.

● HONORED BY D.C.A.T.

The Drug, Chemical and Allied Trades Section of the New York Board of Trade paid special honor to John J. Toohy, Manager of Distribution for E. R. Squibb & Sons, at a recent Executive Committee meeting. In awarding an engraved gavel, S. B. Penick, Jr., President of S. B. Penick & Company and Chairman of the Section, expressed the sincere appreciation of the entire membership of the Section for the conscientious and successful work accomplished by Mr. Toohy in 1941 when he was the Section's Chairman.

At the conclusion of his chairmanship last year, Mr. Toohy automatically became a member of the Section's Advisory Council which consists of the five most recent chairmen. Other members of the Council include: Ralph E. Dorland, William D. Barry, Philip M. Dinkins, and Joseph A. Huisking.

● LONG RANGE RESEARCH PROJECTS

Urging American industry to continue longe range research projects if at all possible, Dr. Donald Price, newly-elected vice-president of the American Institute of Chemists, maintained that such policies will contribute much to the war effort, in addition to providing products and processes which will "carry" industry after the war.

Dr. Price, who is technical director of National Oil Products Company, Harrison, N. J., speaking at the Twentieth Annual meeting of the American Institute of Chemists on "The Chemist in Today's Industry," contended it would be "highly unwise to abandon all long range research, even under the stress of war."

"Obviously, winning the war comes first, for if we should lose it nothing else would matter much," Dr. Price said. "However, the important bearing of long range research projects on the war effort might easily be overlooked.

"Manifestly, the present is no time to initiate new long range projects, but where such programs are well advanced as many as possible should be kept going. This makes the research director's job more difficult than ever as he has to decide what is to be dropped and what is to be retained. Considerable ingenuity is required to decide what long range projects are likely to be most fruitful in results valuable for the war effort, as well as for after the war."

Other speakers at the meeting included Dr. Gustav Egloff, who spoke on "The Petroleum Chemist at War"; Dr. A. B. Ray, who discussed "The Technical Point of View," and Col. O. C. Wyman, who spoke on "The Chemical Industry, Selective Service and the War Effort."

● BAG PRODUCTION

The entire production of bag osnaburg and bag sheeting provided for in the recent WPB textile conversion order (L-99) will be needed to meet minimum military and agricultural demands, T. M. Bancroft, Chief of the Carded Cotton Fabrics unit of the War Production Board, said recently.

Mr. Bancroft made his statement because of recent reports in some quarters that an over-production of osnaburg would result from the conversion order.

Mr. Bancroft said that some months ago the Defense Supplies Corporation was authorized to purchase large yardages of bag osnaburg and bag sheetings for stock-pile, but because of the great need of bags for agricultural products and the limited supply, only a very small yardage was purchased.

The situation has not changed. The Defense Supplies Corporation still stands ready to make such purchases, but no offers have been received.

BOOK REVIEW

Organic Reagents In Inorganic Analysis. *Paul von Stein. 242 pages. Published by Chemical Publishing Company, Inc., 234 King Street, Brooklyn, N. Y. Price* $4.50.

This book is a complete reference work of organic compounds which yield indicative reactions with inorganic materials. Included are the pertinent facts connected with each determination under consideration, as well as reference to the original articles from which the material has been drawn.

Today metallo-organic reagents are of prime importance to the analyst, mainly for three specific reasons; they bring within range, accuracy equivalent to, or greater than, that obtained with inorganic methods; speed surpassing that of inorganic reagents, and ease of manipulation and separation.

The plan used is laid out in the simplest possible form to enable the greatest utilization of the material contained herein. All of the elements dealt with are included in alphabetical sequence, each element composing one chapter, which is further subdivided into paragraphs with the organic reagent under consideration as the sub-title. Every chapter contains as many different reagents as can successfully justify classification under that element. Included with each descriptive paragraph are the necessary references, facilitating a literature search, rather than a lengthy disturbing bibliography at the conclusion of the book. The attempt has been made to present methods as completely as possible, especially in the cases where extreme care and accuracy of technique is required, and in the more important procedures which may possibly be coordinated into routine practice.

At the present time there is no treatise covering this subject with as much completeness. Information that is most vital to the analytical research chemist, is incorporated in this book.

PACKAGE TESTING

(Continued from page 348)

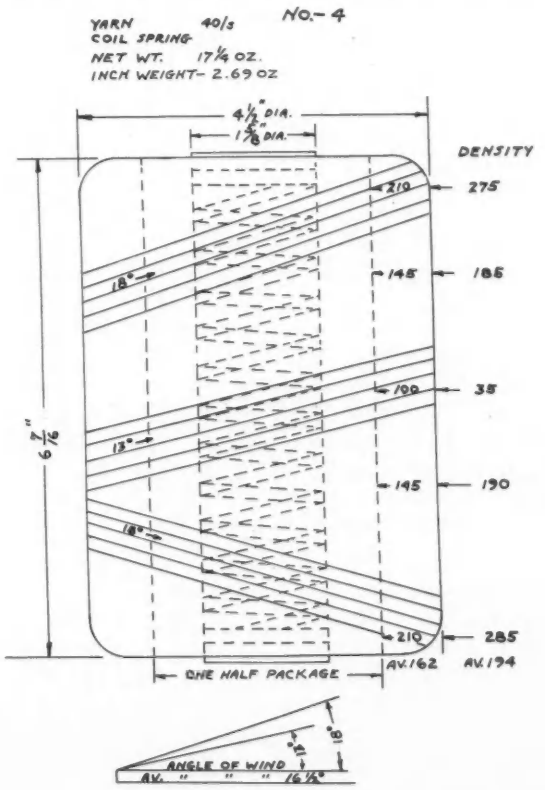
With controlled yarn preparation, and standards with zones of tolerance, this hazard of streaky, unpenetrated dyeing or production loss and increased costs can be eliminated.

NO. 4

The outstanding feature of this package is in the change in angle of wind. Roughly speaking, if we lay this package on its side and slice it into three parts, the two ends would have an 18° angle wind and the middle portion a 13° wind. This angle of wind persists from the outside to the coiled spring. This is not accidental but a designed feature.

All packages examined indicate it is impossible to wind with an 18° angle without making hard ends, and this package is no exception. We were unable to develop a test for measuring the hardness of these ends, but by measuring the degree of wind and observing dye penetration, we found that all wide angle winds build hard ends, and they are critical dyeing areas. This fault limits the package to that size that the ends can be penetrated. This six and seven-sixteenths inch package with only seventeen and one-quarter ounces of yarn is a typical example.

The average density number is very low, a reason for a low net weight of yarn. To dye a larger package of this low density would be hazardous, if not impossible. The examination of the individual density shows the results of flattening the angle of wind in the middle of the package. The winding speed being constant, the delay of the traverse in the middle of the package builds a hard center



which decreases from 100 at the half-size down to 35 at the outside. This hardness would increase if the package were made larger. The resistance to dye penetration in this area is just as great as, if not greater than, in the hard ends.

Increasing the density and building the package harder on the ends, middle or all over as it increases in size, is undesirable. It not only impedes the dye flow but it puts too much tension on the outside yarns.

It might be pointed out that yarns wound on coil springs are loaded in columns and compressed by the cover of the dye kettle. This compression has an equalizing effect on any small differences in the density of the packages, but in no case can it equalize the great differences in the densities of this package. In the first place, it is doubtful if the mechanical equipment for fastening the cover on a large kettle is strong enough to compress the columns to an equal density which, for this package, means a common density number of 35, and, in the second place, if it could, packages with the low density index of 35 would be impossible to dye.

NO. 4-A

A duplicate test was made on a second package from the same production and the comparison is:

	No. 4	No. 4-A
Weight (net)	17¼	16
Size	6-7/16 x 4½"	6-7/16 x 4½"
Yarn count	40/s	40/s
Angle of wind	13°-18°	13°-18°
Average density	194	234
Inch Weight	2.69 oz.	2.48 oz.

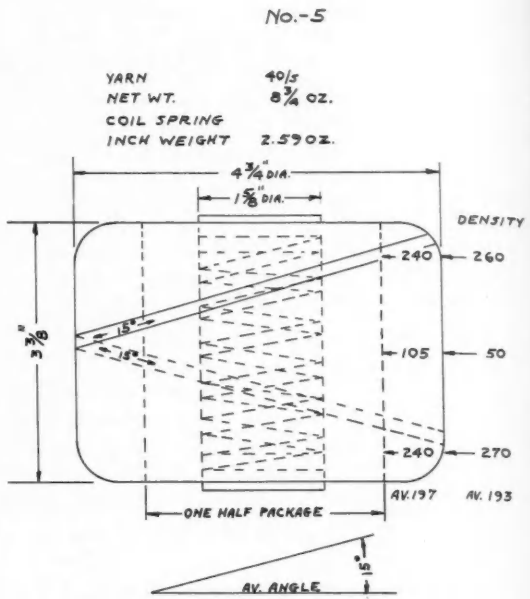
Size, yarn count and angle of wind are the same, but the weight and density differ. The difference in density is too great for good dyeing results of larger packages. As would be expected, the softer package is lighter in weight—7¼ per cent lighter. This is not of great importance, but package weight can and should be within a tolerance of one-quarter ounce. The density of 4-A is higher than 4, but even this is too low for best dyeing results. The difference between 4 and 4-A is 40 and disparity in dyeing results are discernible at these low densities with this difference.

The inch weight is an interesting figure here because we can directly compare these six and seven-sixteenths inch packages wound on a very modern machine against the No. 1 three-inch package wound on old equipment.

The average inch weight of these packages is 2.53 ounces against 2.50 ounces of No. 1. This comparison does not indicate any progress in package winding, at least no progress of increase in package size.

NO. 5

This is a small (three inch) package and is the same type of wind as No. 4, six inch. In this drawing we have shown an *average* angle of 15° but we know it was not an *even* angle of 15°. It was perhaps very near a 13°-18° but on this small three and three-eighths inch package, it was impossible to determine it accurately, so we only show the average angle. The fact that it was a changing angle of



wind is proven by the density figures. Three density tests were made both at the full-size package and at the one-half size package. The two end density numbers have raised from 240 at the one-half size package to 260 and 270 at the full size. The center density number of 105 decreases to 50, or very hard, at the full size. The remarks about No. 4 would apply for this one. A duplicate test was made on another package from the same batch and compares as follows:

NO. 5-A

	No. 5	No. 5-A
Net weight	8¾ oz.	7¾ oz.
Size	3⅜ x 4¾"	3⅜ x 4¼"
Yarn count	40/s	40/s
Angle of wind average	15°	15°
Density	193	258
Inch Weight	2.59 oz.	2.3 oz.

No. 5-A is one-half inch smaller in diameter and 11.4 per cent lighter in weight with a much softer average density. This is too much difference from package to package plus a very bad angle of wind. These differences are no doubt the reason for the very low net weight of these packages. To lessen the hazards of dyeing these two packages in the same kettle it is compulsory to keep the package weight low and the size small.

The average inch weight of 2.44 ounces suffers in comparison with the 2.5 ounces of No. 1, again illustrating that as far as increased package weight and dye house production is concerned, there has been no progress in package preparation.

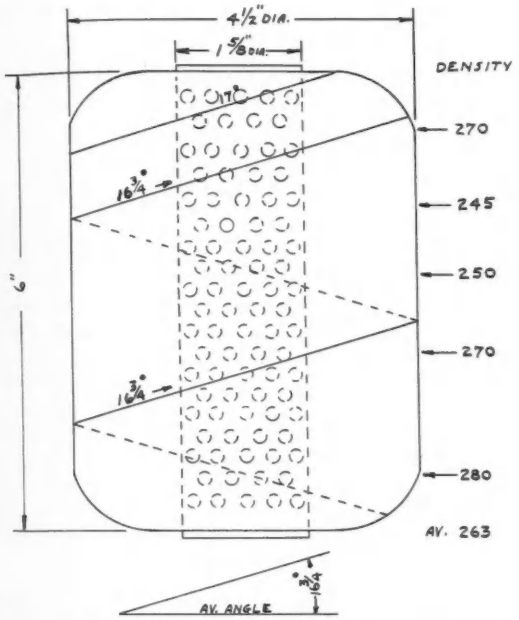
NO. 6

Of all the packages examined, this was the only truly six inch package. The rounded shoulders on this package indicate it had been cupped to improve dye penetration in these areas. Wound on a rigid metal tube, there is no change in angle of wind or density when in dyeing posi-

tion. This was intended, no doubt, for a 17°-18° angle of wind but the hard ends resulting from this wide angle necessitate cupping or crushing the ends to improve dye penetration. This difficulty of penetrating the ends may be the reason for the low net weight of thirteen and one-quarter ounces. There should be no difficulty in the level dyeing of these tiny packages of low net weight with the extremely low inch weight of 2.21 ounces, but the production loss is great with a correspondingly high cost.

No.- 6

YARN 18/3
NET WT. 13¼ OZ.
PERFORATED TUBE
INCH WEIGHT — 2.21 OZ.



Improved and controlled wind of larger packages would amazingly increase dye house production.

NO. 7

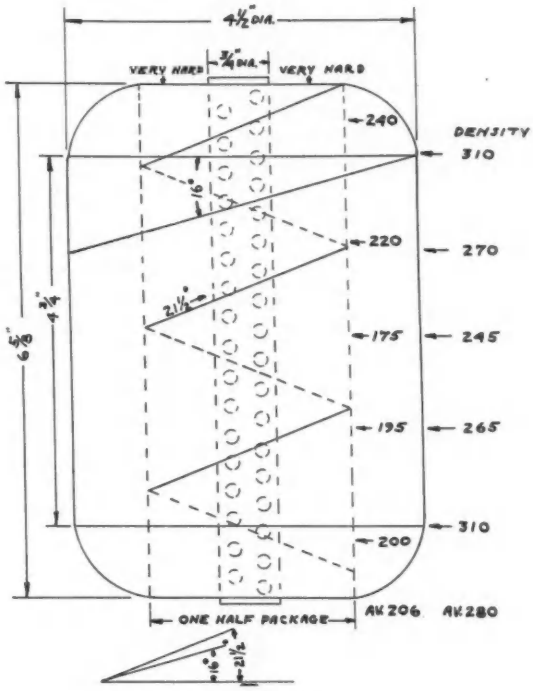
This is a very interesting package because it has an extremely open angle of wind. The true winding angle is 21½° but cupping the ends closes the pitch to make a 16° angle wind on the outside of the package. The elliptical ends formed by this crushing operation prohibit testing the ends by our method, but, as expected, the ends of a package wound with this extreme angle of wind were very hard. Potential trouble from unpenetrated ends and "cross overs" could be expected from this type of package even with this medium weight and it was so reported. A softer density for this two-ply yarn would give some relief but it is already reasonably soft and the only real cure is to cut down the angle of wind.

NO. 8

This was wound on the same core as No. 7 but came from a different plant. With a lower density index and angle of wind, the ends were not as hard as No. 7. The elliptical ends indicate they had been crushed to improve dye penetration in these areas. The crushed ends, the wide angle of wind and the density figures arouse the suspicion that

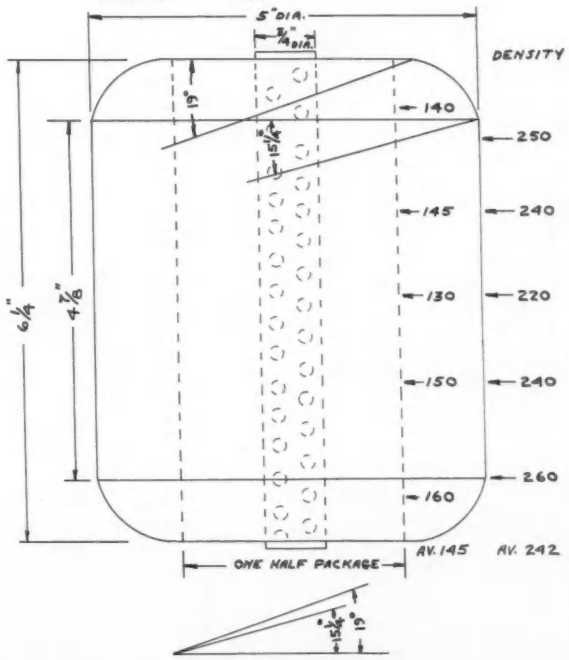
No.- 7

YARN 18/2
NET WT. 19 OZ.
TUBE 5/8"
INCH WEIGHT 2.87 OZ.



No.- 8

YARN 29/1 C.P.
NET WT. 22¾ OZ.
TUBE ¾"
INCH WT. 3.64



on a package of this size, level dyeing and penetration of the ends with a rapid exhausting vat color is difficult and, on critical work, a source of annoyance.

The inch weight is almost 20 per cent heavier than No. 7 and 65 per cent heavier than No. 6 which it most closely resembles.

The size and weight of this package are good and lowering the angle of wind would remove most of the dyeing hazards.

NO. 9

The important differences in this package are the yarn count and density. A hard twist 50/3 yarn will shrink and take up more than a single or even a two-ply yarn. Packages of this count must be wound with a soft density to allow for shrinkage. From a dyer's point of view, a soft package is best for this yarn count, but it is more important that all the packages be of *equal* density, and that is almost impossible with a density number as high as 474. A lowering of the density number cannot be carried too far with an 18° angle wind or there will be trouble from hard ends and "cross overs."

Because of the unusual yarn count this yarn should have unusually careful winding preparation. The two inherent dangers are of winding too hard or too soft. If wound too hard, good penetration of the dye bath would be extremely difficult; if wound too soft, it would be almost impossible to maintain a standard density within the necessary tolerance. Unless the density is maintained within reasonable tolerance, discernible differences in dye penetration would result.

For a hard twist three ply yarn, the weight of this package is good.

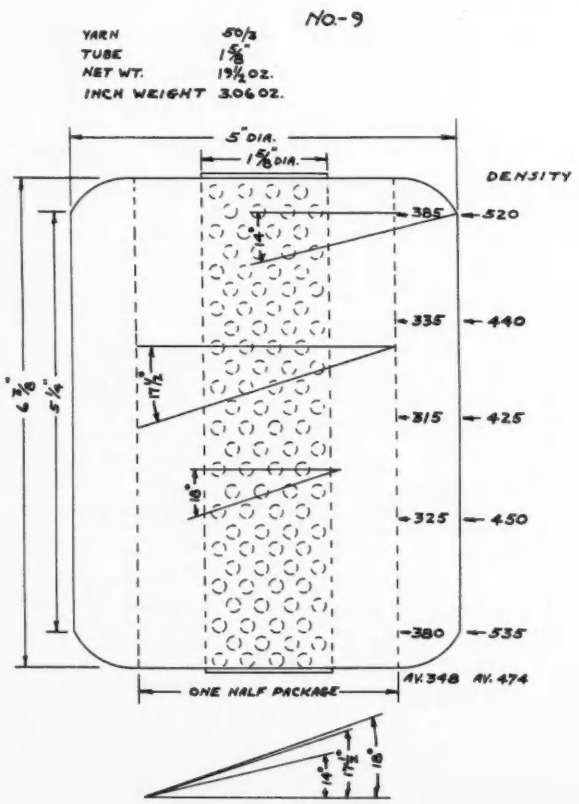
NOS. 10, 11, 12 AND 13

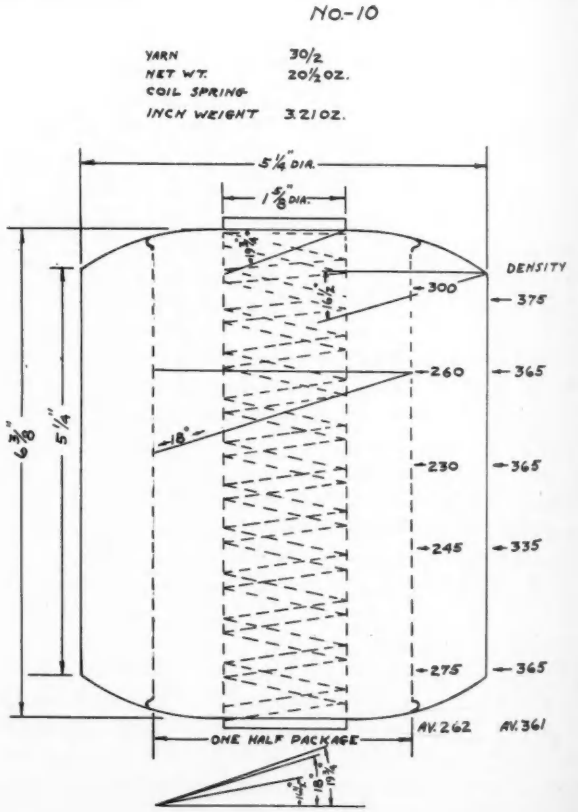
These four packages are grouped. They are interesting as a group because they are different yarn count wound on the same equipment. The elliptical ends are a natural formation and not caused by cupping or crushing the ends after winding. When a wide angle of wind of 19°-20° is used to build a package with a soft density, the knuckles formed at either end of the throw of the traverse build faster than the rest of the package. These harder ends riding on the driving roll restrict the yarn throw and continually shorten it to form packages with round shoulders such as these.

Considering the different yarn counts these packages have very consistent densities.

The control of weight is also very good but a lower angle of wind would be an improvement and permit dyeing even larger packages.

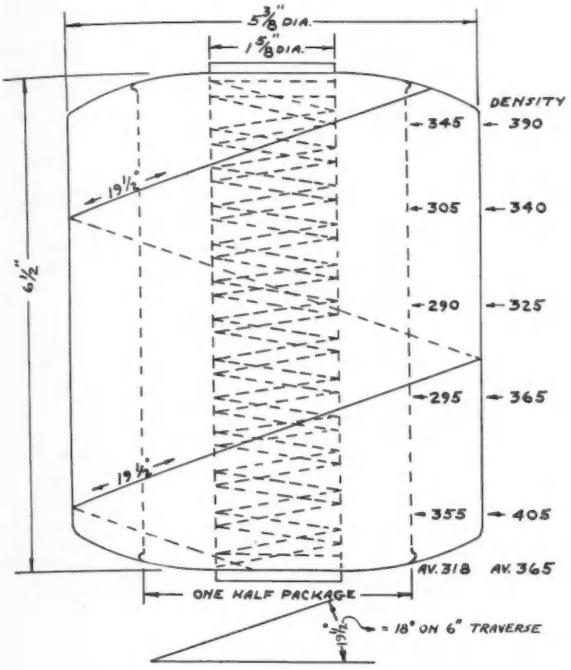
These are a few of the packages examined and are sufficient to illustrate incredible inequality of package preparation. The pressure dyers working on these packages have no common ground of understanding. They cannot discuss their problems intelligently because the package problem of one dyer may be, and no doubt is, entirely unlike the package problem of the other. To take the simple figure of inch weight, for example, there is sixty-five per cent difference in the lightest and heaviest package. The





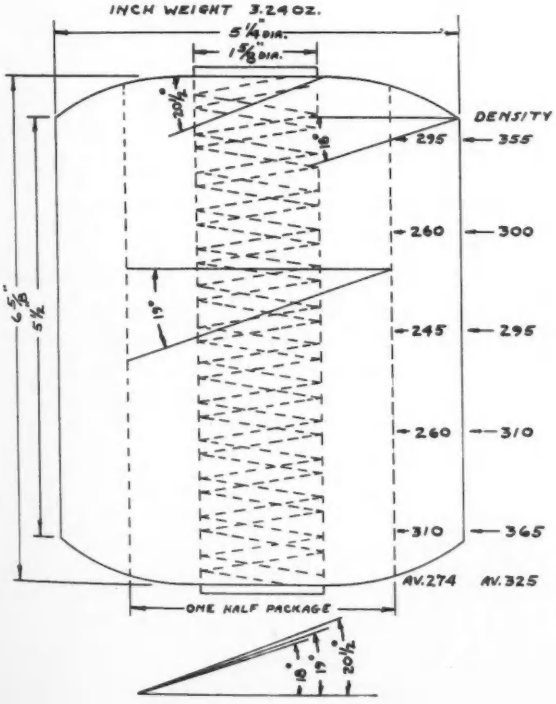
No.- 11

YARN 7/2
NET WT. 22 OZ.
COIL SPRING
INCH WEIGHT 3.38 OZ.



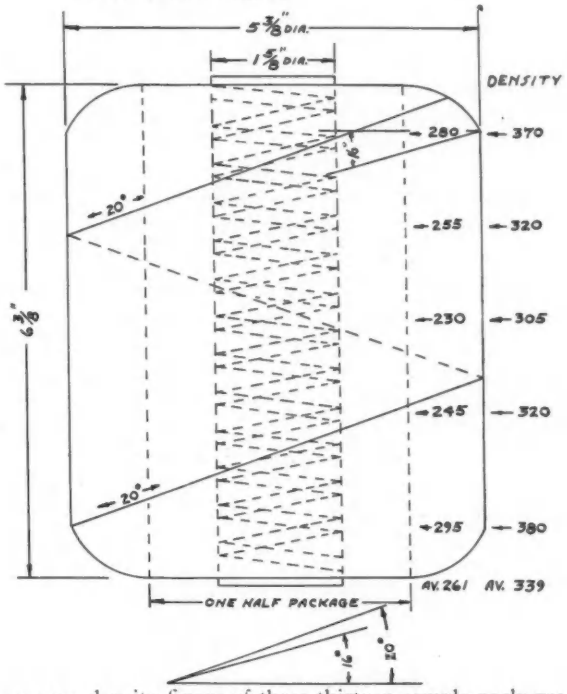
No.- 12

YARN 10/2
NET WT. 21 1/2 OZ.
COIL SPRING
INCH WEIGHT 3.24 OZ.



No.- 13

YARN 20/2
NET WT. 20 1/2 OZ.
COIL SPRING
INCH WEIGHT 3.21 OZ.



average density figure of these thirteen sample packages is 300, but the extremes are —107 (193) and +173 (474). The change in yarn count is not a reasonable explanation for this difference because all these yarn counts can be dyed with a —40 (260) and a +70 (370) tolerance of the average density of 300.

The trend of using more open angle of wind may increase the flow of the dye bath but it also builds harder ends. Receiving wide angle wound packages with hard ends places the dyer in a sorry dilemma. If he crushes the ends, it will close the angle of wind on the surface of the package and nullify the advantages of wide angle winding.

It will be noted that the flow of the dye bath has been mentioned in this paper but not the rate of flow. This factor has been constantly in mind but purposely omitted because until we solve the problem of package preparation, we have no means to correctly measure the rate of flow in terms of our craft. While the engineer has several ways of measuring the rate of flow in gallons per minute, these terms cannot be directly converted into size and weight of a package of yarn that can be dyed level. As a matter of fact, we need not borrow the engineer's gauge or terms to measure the rate of flow. Our packages with a substantive dye as an indicator are the most practical and positive gauge to measure the rate of flow. At the present time we cannot trust our gauge; it is not standardized; nor can we read it with understanding.

No. 4 package is a good example of why we cannot ac-

cept the engineer's terms of gallons per minute of measuring. Most of the flow would be through 18° angle wind and soft part of the package with a slower flow through the hard ends and hard middle; so the total flow in gallons per minute would not be an equal flow throughout the package.

What effect does yarn preparation have on shade matching? These packages, as should be the case, when examined, were grey yarn but as they would have been dyed by master dyers, we can assume they would be dyed a perfect match, but yarn preparation has a very definite effect on shade matching. Improperly prepared packages limit and restrict the dyer's selection of dyes.

The proper dye of best fastness is often passed by for one more soluble and slower exhausting. However, matching shades is perhaps the least of a pressure dyer's troubles. What is most annoying and discouraging is to make a good match only to open the kettle and find unpenetrated streaky packages and with full realization it is not a chemical problem but that he must try to solve it as such. These problems of streaky yarn, redyeing to level, cost extra kettle time; lost production can be traced to lack of control in yarn preparation.

Apparently little effort or study has been made to change the package to fit the process. A casual inspection of pressure kettles would impress one that a single type or build of package would not be best for all. When preparing a package for dyeing, the speed of wind and pounds production should be only secondary factors. Preparing yarn for dyeing comes first. The winding cost per pound is insignificant compared to the twenty to thirty or more cents of dyestuff, chemical and labor costs that will be added to each pound of yarn in the dyeing process.

Properly controlled and supervised yarn preparation will increase amazingly the quality and quantity of the dye house production. It will increase the flexibility of the dye kettle; it will widen the choice of dyes to include more than just the extremely soluble and slow-exhausting ones. No dye house can afford to neglect a study of yarn preparation.

Winding machine builders can greatly assist in the study of yarn preparation. There has been much greater progress and ingenuity in dye-kettle design and in dye application than in package design and control of wind. The winding machine builder's responsibilities do not end in marketing a machine to wind a three, four, six or eight inch package. They should know that the best wind for a coiled spring core is not best for yarn wound on a perforated rigid tube. They should have a better knowledge of the effect of angle of wind on dyeing, of the best shape package, and, very important, of the importance of density and the control of it.

Because of our negligence in specifying what we desire we cannot criticize too freely what we have been given. Proper solution of this problem would prove that the statement, "90 per cent of the success of pressure dyeing is in the yarn preparation," is a truism and not an exaggeration.

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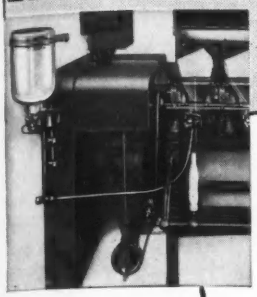

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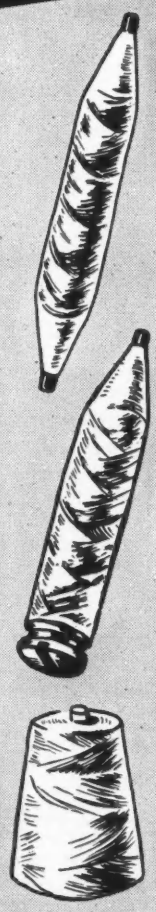

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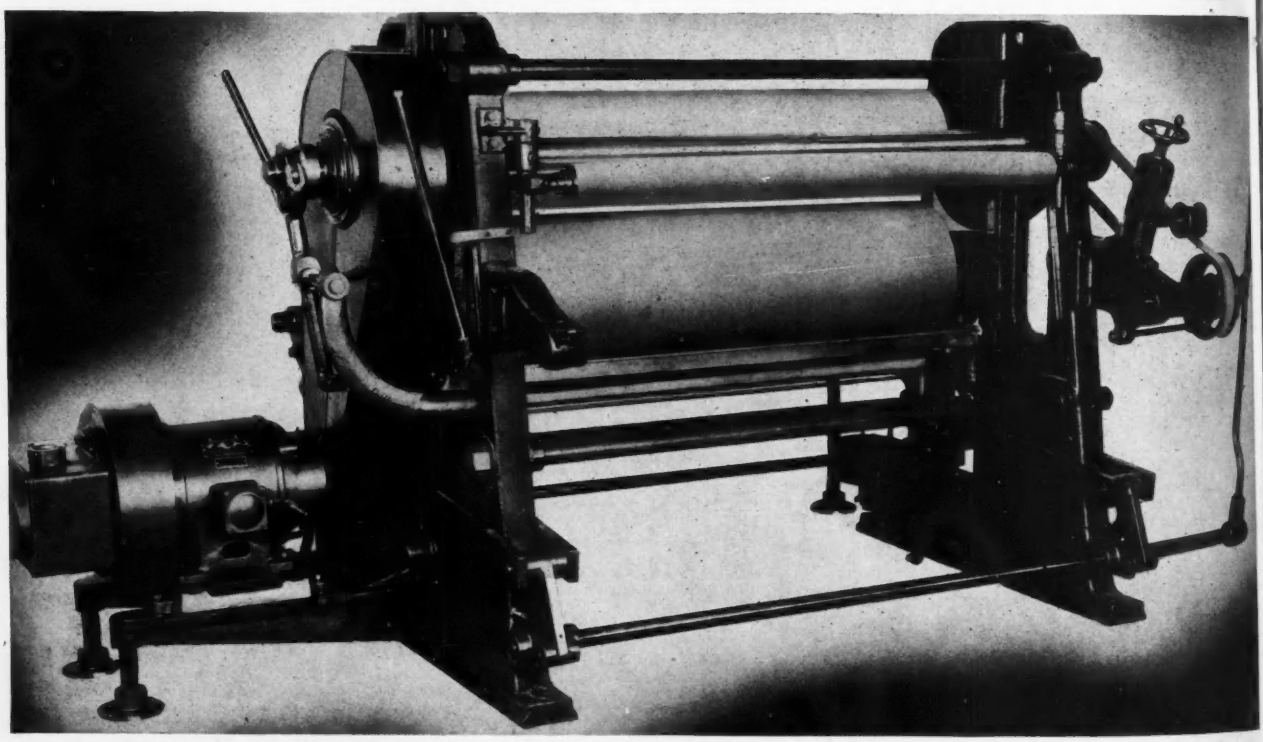

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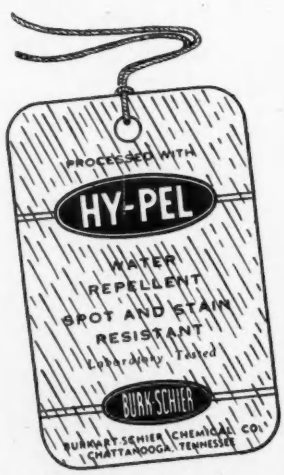
HY-PEL

WATER REPELLENT

for



COTTONS
RAYONS
WOOLENS

Hy-Pel treated fabrics are water repellent. They also resist spotting, staining and perspiration. The Hy-Pel process does not affect the appearance, texture or porosity of the fabric. Hy-Pel is a one bath water repellent and is applied on the quetch, padder, jig or beck. Efficient-Economical-Durable.

BURKART-SCHIER CHEMICAL CO.

BURK-SCHIER CHATTANOOGA, TENNESSEE BURK-SCHIER

PENETRANTS • SOFTENERS • SOLUBLE OILS • FINISHES

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TEXTARID CS is an important aid for every finisher working with shelter tent duck and similar cotton fabrics for Army use. Textarid CS (regular Textarid with the addition of the correct amount of mildew-resistant chemical to prevent it from mildewing) takes the standard spray and hydrostatic tests in its stride.

In addition, Textarid CS will give you a new slant on how economical a really good water-repellent finish is to use! No special equipment or revamping of your mill facilities are required—an extra advantage, these days!

Begin now to make the most of the advantages of Textarid CS in treating cotton fabrics which must be both water-repellent and mildew-resistant.

Where a mildew-proofed agent is not required, Regular Textarid Water-Repellent Finish meets all standard requirements for water-repellency. Use it, too, for civilian fabrics, and profit by the sales-building Textarid Tag!

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WATER REPELLENT

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L. SONNEBORN SONS, INC., NEW YORK, N. Y.

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Now—on all oceans!

Textiles go to the farthest corners of the earth with America's fighting bluejackets . . . clothing them, protecting them, keeping them fit.

He's a busy man . . . the American sailor. He works all day, every day . . . in rain and bad weather or in bright, strong sunshine.

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It calls for tremendous yardages of the most rugged fabrics the Textile Industry can produce.

It demands all-out production from every machine to produce all the clothing and equipment needed by our armed forces, plus the essential textiles for civilian use. Only in its mechanical equipment is the Textile Industry vulnerable.

In the Wet End of Textile Finishing, you, the Mills, must seize every opportunity to repair or replace worn-out equipment.

The breaking of production bottlenecks is a vital contribution to the cause of winning the war. It is part of our job to help you maintain and even increase the flow of Textiles for Victory.

All of our facilities not required for Ordnance production are available for building Finishing Equipment. Deliveries on appropriate priorities to mills serving the war effort.

***64%**

of equipment now in use in the wet end of textile finishing cannot operate at a profit in competition with modern machines.

*Proved by Research

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Phila., Pa. Serving the Textile Industry since 1820
Offices in Providence, R. I. and Charlotte, N.C.
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For over 35 years much of milady's apparel has been processed with chemical compounds produced by Scholler. From head to toe—hosiery, gloves, blouses, skirts and underthings—all have been enriched in beauty and added-to in wearability. . . . And, for every Fibre available today, there is a Dura-Beau* *Finish* to give it added beauty and miles more wear . . . all: "Tailored to fit the Fabric."

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RESEARCH!

TEXTILE INDUSTRY

Cyanamid Research Laboratories at Stamford, Conn., where chemical, physical and engineering problems are correlated. Laboratories are also maintained at the many Cyanamid plants.

The Electron Microscope at the Stamford Laboratories, the first of its kind in commercial use, is capable of enlarging 30,000 times, revealing many physical and chemical characteristics important to Cyanamid's research in textile chemicals.

The extraordinary demands of the times are such as to tax the ingenuity of all industry. The textile industry, too, is faced with additional burdens on its capacities, and problems as to its processes and materials. Only the best is equal to the job to be done... and the importance of the proper selection of raw materials to meet the new requirements is greater than ever before.

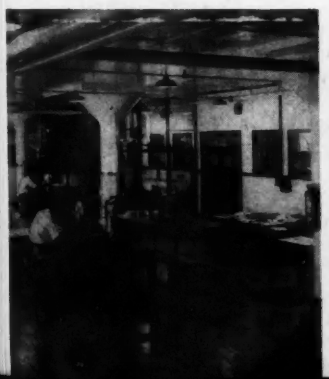
At Cyanamid, research in textile chemicals, always an important phase of the Company's activities, is directed toward advancing the means and methods of meeting present conditions, and conditions that may be faced in the future. The many chemical specialties Cyanamid supplies... sulphonated oils, penetrants, softeners, finishes, sizing compounds, wetting agents and others... are subjected to critical examination for ways to improve quality and to broaden their usefulness. New products are developed to meet new conditions and to replace others made unavailable due to the emergency. In this work Cyanamid coordinates the most modern chemical, physical testing, and analytical equipment with the talents of a highly trained laboratory staff... a procedure that has succeeded through the years in producing better products at lower costs and many new products of timely application to the needs of users of chemicals in industry.

Cyanamid research is devoted not only to matters of materials but also to methods and equipment as well. Cyanamid's chemists, technicians, and representatives, thoroughly trained in the fields they serve, are prepared to examine, test and counsel in relation to specific conditions in a manufacturer's own plant, and help him solve emergency and "chronic" production problems. In any matter relating to the selection and use of textile chemicals, Cyanamid is "on call" to assist you in the most practical and economical way. There is no obligation.

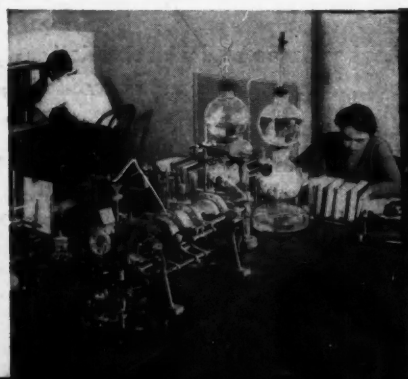
The Launderometer and Heat Curing Box for testing of resin applications are representative of the modern equipment in Cyanamid's Textile Chemicals Laboratory at Stamford.

SULPHONATED OILS; PENETRANTS; SOFTENERS; FINISHES; SIZING COMPOUNDS; DECERESOL* WETTING AGENTS

A section of the Physical Testing Laboratory.



A corner of the Micro-Analytical Laboratory.



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